This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

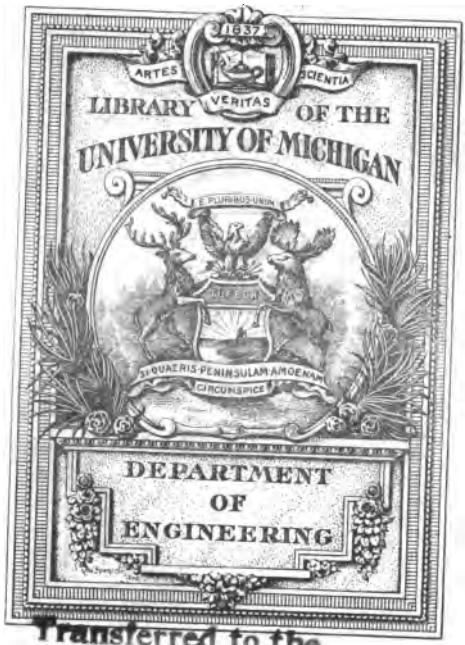
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

B 1,022,529



Transferred to the
GENERAL LIBRARY

THE GIFT OF
Institution

GEN. LIBRARY.

Z
5854
.I59

SUBJECT-INDEX

TO THE

CATALOGUE OF THE LIBRARY

OF

THE INSTITUTION OF CIVIL ENGINEERS,

London. Library.

A-L.

LONDON:
Published by the Institution,
GREAT GEORGE STREET, WESTMINSTER, S.W.
[TELEGRAMS, "INSTITUTION, LONDON." TELEPHONE, "WESTMINSTER, 51."]
1904.

LONDON:
PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,
DUKE STREET, STAMFORD STREET, S.E., AND GREAT WINDMILL STREET, W.

PREFACE.

THE present Index forms a key to the subject-matter of the books, pamphlets, etc., enumerated in the Author-Catalogue of the Library published in 1895; and the references are to that Catalogue. When the heading referred to is the name of an Author, the date of his publication in question is added for the sake of precision, *e.g.*:—

ARCHES.
Treatise on the Oblique Arch. NICHOLSON (P.), 1846.

312.6.05

When the reference is to such a heading as ANONYMOUS, PERIODICAL PUBLICATIONS, or PARLIAMENTARY AND STATE PAPERS, or to an other extensive heading (*e.g.*, INDIA, LONDON, etc.), the page in the Author-Catalogue is added, with the same object; thus—

BRIDGES (RAILWAY).
Bridges to carry a single line of Railway over an occupation road. ANONYMOUS, p. 41.
CANALS (PARTICULAR).
Calcutta Eastern Canals. INDIA, 1883, p. 99.

The abbreviations "Add." and "App." prefixed to a page-number refer respectively to the ADDENDA and the APPENDIX printed at the end of the third volume of the Author-Catalogue.

137478

CATALOGUE OF THE LIBRARY

OF

THE INSTITUTION OF CIVIL ENGINEERS.

SUBJECT-INDEX.

(TO DECEMBER, 1894.)

A—L.

ABATTOIRS. See SLAUGHTER HOUSES.

ACCIDENTS.

Associations pour prévenir les Accidents du travail. COLNE, 1891.

Bridges. Liége. Causes of the Accident at the Foot Bridge between the Rue Régence and the Boulevard Sancy. KRAFT and Libert, 1881.

—— St. Charles Bridge Disaster, Nov. 8, 1879. Testimony at the Coroner's Inquest. YONGE (S. H.).

Cables in Mines, breaking of. AGUILLON, 1881.

Catastrophe at Zug, 5 July, 1887. HEINE, &c.

Chimney Disaster, Cleckheaton. Report. YORKSHIRE Boiler Insurance, &c., 1892.

Factory and Workshop Employees, 1889. PARLIAMENTARY..Papers, p. 464

Machinery. Protection of Life from Casualties. WATSON (William), 1879.

—— Return of Accidents caused by Circular Saws and other Machinery used in Woodwork. 1887. PARLIAMENTARY..Papers, p. 486.

Mills. Report on fall of Templeton Mill, at Greenhead, Glasgow. TEMPLETON Mills, 1890.

Mines. Report of Select Committee, 1835. PARLIAMENTARY..Papers, p. 487.

ACCIDENTS—*continued.*
Mines. Report of Commissioners, 1881–86.
PARLIAMENTARY..Papers, p. 487.
—— Mining Accidents, 1889. PARLIAMENTARY..Papers, p. 464.
—— Summaries of Fatal Accidents, 1893.
PARLIAMENTARY..Papers, p. 487.
—— See MINES (Explosions).
Oil (Mineral) Lamps. Reports. PARLIAMENTARY..Papers, p. 492.
Potentite. Factory at Conscough Bridge, Lancs.
CONSCOUGH Bridge, 1885. At Melling, MELLING, 1882.
Railway Servants. PARLIAMENTARY..Papers, p. 464.
Sea. Reform of Maritime Police. LOSSIGNOL, 1860.
See also COAL MINES (Accidents). EXPLOSIONS. Railways (Accidents).

ACCUMULATORS. See ELECTRICITY (Secondary Batteries).

ACOUSTICS (GENERAL).
BARRETT (W. F.), 1869; CHLADNI, 1809; LARDNER, 1874; WEBER (Wilhelm), 1892–94.
—— Theoretical. DONKIN (W. F.), 1870.
Public Buildings. LACHEZ, 1848.
See also SOUND.

ADDRESSES. Academy of Science, St. Louis. EADS, 1872.
American Association. BARKER (G. F.), 1882.
American Gas Light Association.
FORSTALL, 1883; HICKENLOOPER, 1882.
American Society of Civil Engineers.
CHANUTE, 1891; MCALPINE, 1868.
Amsterdam, Congress, 1879. CHADWICK (Sir E.), 1879, p. 235.
Arundel Society. Exhibition of works of art, 1855.
WYATT (M. D.).
Association of Municipal and Sanitary Engineers and Surveyors.
GORDON (J.), 1887.
Association of Public Sanitary Inspectors.
CHADWICK (Sir E.), 1884, p. 234
Australasian Association for the Advancement of Science.
BELL (C. N.), 1892; RUSSELL (H. C.), 1886.
Bombay Mechanics' Institution. BERKLEY (J. J.), 1857.
Boston Society of Civil Engineers. FITZGERALD (D.), 1889.
British Association. ABEL (Sir F. A.), 1890; AIRY (Sir G. B.), 1851, p. 15; ARMSTRONG, 1881; BRAMWELL, 1888; FORBES (J. D.), 1834; HAWKSHAW, 1885; MURCHISON, 1846; SIEMENS, 1869, 1882; WHEWELL, 1833.
—— Mathematical and Physical Science Section.
SPOTTISWOODE (W.), 1865.

ADDRESSES—*continued.*

British Association. Mechanical Science Section. BAKER (Sir B.), 1885; BIDDER, 1868; BRAMWELL, 1872; FROUDE (W.), 1876; HEAD (J.), 1893.

British Association of Gas Managers, 1870. OHREN.

California University. Inauguration. CALIFORNIA University, 1893. Add 490.

Cardiff Naturalists' Society. PRICE (P.), 1884.

Civil and Mechanical Engineers' Society. ADAMS (H.), 1890; BOYD (R. N.), 1890; BREWSTER (E. H. G.), 1880, 1886; DRIVER, 1878; HAUGHTON (B.), 1868; MIDDLETON (R. E.), 1887, 1888.

Convention of Agricultural Colleges and Experimental Stations. COLMAN (N. J.), 1885. Add 493.

Dublin Geological Society. MALLET (R.), 1847.

Dudley and Midland Geological Society. MURCHISON, 1842.

Engineering and Scientific Society of King's College, London. WORMS (H.), 1860.

Engineers' Club of Cincinnati. BOUSCAREN, 1889; MERRILL, 1888.

Engineers' Club of Philadelphia. WILSON (Joseph M.), 1889.

Engineers' Club of St. Louis. MOORE (Robert), 1893.

Ethnological Society of London. BRODIE, 1854.

Gas Institute, London. NEWBIGGING, 1885.

Geological Society of London. DELABECHE, 1848, &c.; HOPKINS (W.), 1852; LYELL, 1851; PRESTWICH (J.), 1872. Add 529.

Geologists' Association, London. WOODWARD (H.), 1873.

Hull and District Institution of Engineers. BOHN (G.), 1888.

Incorporated Association of Municipal and County Engineers. EAYRS, 1893.

Incorporated Gas Institute. VALON (W. A. M.), 1892.

Institution of Civil Engineers. CUBITT (Sir W.), 1850; FOWLER (Sir J.), 1866; RENDEL (J. M.), 1854; RENNIE (Sir J.), 1846; SIMPSON (J.), 1854; STEPHENSON (R.), 1856.

—— Manchester Students. VAWSER (R.), 1887.

—— Newcastle-on-Tyne Students. HARRISON (C. A.), 1894. Add. 505.

Institution of Civil Engineers of Ireland. MALLET (R.), 1866; GRIFFITH (J. P.), 1887; STONEY (B. B.), 1872.

Institution of Electrical Engineers. SIEMENS (A.) 1894.

Institution of Engineers and Shipbuilders in Scotland. KIRK (A. C.) 1887.

Institution of Mechanical Engineers. ARMSTRONG, 1869; BRAMWELL, 1874; TOMLINSON (J.), 1890; WHITWORTH (Sir J.), 1856.

ADDRESSES—*continued.*

Iron and Steel Institute. ABEL (Sir F. A.), 1891; BELL (Sir I. L.), 1873, 1874, p. 120; PERCY (J.), 1885–6.

Junior Engineering Society. BARRY (J. W.), 1893; HOPKINSON (J.), 1892.

Liverpool Engineering Society. BOULNOIS, 1893. JOHNSTON (R. E.), 1893.

Manchester Association of Employers, Foremen and Draughtsmen. ASHBURY, 1883.

Manchester Geological Society. DAWKINS, 1874.

Massachusetts Institute of Technology. LOWELL, 1890.

Melbourne. Proposed Burke and Wills Group of Statuary. MILLAR (John), 1862.

Munich. Akademie der Wissenschaften. PETTENKOFER, 1890.

National Convention of Farmers and Gardeners, New York. GARDNER (D. P.) 1844.

New Zealand. Progress of Applied Science in Canterbury, N.Z. DOBSON (E.), 1880.

North East Coast Institution of Engineers and Shipbuilders. RICHARDSON (W.), 1890.

North of England Institute of Mining and Mechanical Engineers. ARMSTRONG, 1873; WOOD (N.) 1852.

Norwich Geological Society. BLAKE, 1880.

Rensselaer Polytechnic Institute. WILSON (J. M.), 1894, Add 539.

Royal Academy (Sir Joshua Reynolds) 1786–91. ROYAL Academy.

Royal Astronomical Society. AIRY (Sir G. B.), 1850, 1854, p. 15; HERSCHEL (Sir J. F. W.), 1827, 1828, 1829, 1841, 1849.

Royal Geographical Society. GREENOUGH, 1841; HAMILTON (W. R.), 1843.

Royal Institute of British Architects, 1859. TITE (W.).

Royal Institution of Cornwall, 1869, 1871. HENWOOD (W. J.).

Royal Microscopical Society, 1867–68, 1868–69. GLAISHER.

Royal Society. AIRY (Sir G. B.), 1872, p. 15; DAVY (Sir H.) Works, vols. 7 and 8; DAVY, 1827; GILBERT (D.), 1827, 1828, and 1830; NORTHAMPTON, 1839, 1846; SUSSEX (Duke of), 1833–36; WROTTESLEY, 1856.

Royal Society of New South Wales. LIVERSEDGE, 1888; RUSSELL (H. C.), 1892; WARREN (W. H.), 1893.

Royal Society of Victoria. BARKLY, 1860.

Sanitary Institute. MARTEN (H. J.), 1889; RAWLINSON (Sir R.), 1884, 1890; (Sir Douglas Galton), SANITARY Institute, 1892.

Scottish Society of Arts. STEVENSON (D.), 1854.

Society of Arts. ABEL (Sir F. A.), 1884.

ADDRESSES—*continued.*

Society of Engineers. ADAMS (H.), 1890; BERNAYS, 1880; CHURCH (J.), 1883; NURSEY, 1886; ROBINSON (Prof. H.), 1887; VALON (W. A. M.), 1893; WALMISLEY (A. T.), 1888; WILSON (Joseph W., Junior), 1892.

Society of [Civil] Engineers of France. FLACHAT, 1859.

Society of Telegraph Engineers and Electricians. ADAMS (W. G.), 1884; BRIGHT (Sir C.), 1887; CLARK (L.), 1875; SIEMENS (Sir W.), 1878.

South Yorkshire Viewers' Association (J. T. Woodhouse). SOUTH Yorkshire Viewers' Association, 1858.

Tyneside Naturalists' Field Club, 1855. SOPWITH (T.).

University College, London, 1842. DONALDSON (T. L.).

University College, Liverpool (Walker Engineering Laboratories). COODE (Sir J.), 1889.

University of California. HAGER and Holden, 1886.

Victorian Trades' Hall and Literary Institute, 1860. MILLAR (John).

Vienna. K.K. technische Hochschule. OSER, 1887.

Wellington Philosophical Society, 1887. HUTCHINSON (F. B.).

Young Men's Christian Association of Baltimore. GARRETT, 1883.

ADMINISTRATION.

France. BLOCK, 1856.

India. Annals of Indian Administration. PERIODICAL PUBLICATIONS, p. 11.

—— British Rule in Hoshiarpur, 1857. INDIA, p. 119.

—— Report 1873–74. INDIA, p. 110.

—— Report on the Administration of Bengal, 1871–72. INDIA, p. 110.

—— Travancore and Cochin Administrative Reports, 1860. INDIA, p. 132.

London. Evils of Disunity in Central and Local Administration. CHADWICK (Sir E.), 1885, p. 235.

Western Australia Legislative Council. Despatches laid before and Votes and Proceedings of, during 1871. WESTERN Australia, p. 423.

ADMIRALTY.

Administration. ADMIRALTY, 1861.

Admiralty Buildings Extension Scheme. Protest of Institute of British Architects, 1888. PARLIAMENTARY . . Papers, p. 465.

Admiralty Reform. ROBINSON (R. S.), 1886.

Moneys and Accounts, 1868. PARLIAMENTARY . . Papers, p. 465.

Navy and Ships of War. Statutes. ADMIRALTY, 1742.

Present State, 1871. PARLIAMENTARY . . Papers, p. 464.

ADVERTISEMENTS. Advertisers' Guardian, 1885.
COLLINS (L.), 1885.
Advertising Stations (Rating) Act, 1889. Reports.
HAYWOOD (W.) and Baylis, 1891, p. 36.

AERIAL NAVIGATION.
BRUIGNAC, 1875; CHANUTE, 1891; DALLET, 1886; DERVAL, 1889; FONTAINE (J. A.), 1886; GRAFFIGNY, 1888; HARDINGHAM, 1871; MANSFIELD (C. B. and R. B.), 1877; RENUCCI (J. E.) 1866; VAUSSIN-CHARDANNE, 1858, 1873.
Aerial Navigation (China). DELAVILLE-Dedreux, 1863.
Aerial Locomotion. MURRAY (G.), 1865.
Aerial Ship. COURTEMANCHE, 1882.
Aerostatic Machine with Horizontal Direction. MUSY, 1860.
Angus and Mack on the Air path. ARMOUR, 1877.
Apparatus (new) for the direction of Aerostats.
LUZARCHE (L.), 1812. App. 566.
Application of science to the art of war. Aerostation.
WAUWERMANS (H.), 1869.
Attempt at Ottobeuren, 1784. OTTOBEUREN.
Birds considered as living aeroplanes. DRZEWIECKI, 1889.
Dynamic Flight. WECHMAR, 1888.
Experiments and adventures in the Atmosphere.
TURNER (H.), 1865.
Flight of Birds. STAGOPOULOS, 1891; STEIGER, 1891.
Flying Machines. STEIGER, 1891.
Giant Balloon, with notices on the screw applied to aerial navigation. SILAS (T.), 1863.
Military Aerostation. HESS (P.) and WACHTER, 1887; YOU, 1886.
Montgolfier's aerostatic machines. EHRMANN, 1784; FAUJAS de Saint-Fond (B.), 1783. Add 500.
Progress in Flying Machines. CHANUTE (O.), 1894. Add 491.
Societé Francaise de Navigation Aérienne. Bulletin.
SOCIÉTÉ Francaise de Navigation, etc., 1877.
System of Aerial direction. PETUI, 1840.
Thoughts on the Improvement of Aerostation, with description of a new Machine. ANONYMOUS, 1785, App. 545.
Voices in the Air. ARMOUR, 1878.
See also BALLOONS and Ballooning.

AGRICULTURE. ELLERMAN, 1848; KREUTER, 1859.
Advantages of Railways to Agriculture. JOHNSON (C. W.), 1840.
Agricultural improvement of landed property.
MORTON (J. L.), 1858.
—— Lease, Forms and Conditions of. BLACK (J.), 1862.

AGRICULTURE—*continued.*

American Agriculture, Commercial Policy of England affecting. TALLMADGE (J.), 1844.

Amount and Composition of the Rain and Drainage Waters. LAWES (Sir J. B.), Gilbert and Warington, 1882.

Annals of Agriculture, &c. PERIODICAL PUBLICATIONS, p. 11

Austrian Minister. Report. KAAN, 1885.

Belgium. GOURCY, 1849.

Book of the Farm. STEPHENS (H.), 1889

Brazil, Commission. BRAZIL, 1887.

California. Reports of the Agricultural Experimental Stations of the University. CALIFORNIA University, 1890, 1891.

—— State of California. HILGARD, 1884.

California University. Alkali Lands, Irrigation and Drainage in their mutual relations. CALIFORNIA University, 1886.

—— Report of Special Committee. CALIFORNIA University, 1883.

—— Report of the Viticultural Work. CALIFORNIA University, 1886–92.

Canada. Instruction in Farming in, and the United States of America and Tasmania. FORD and Rathbone, 1887.

Cirencester Royal Agricultural College. Prospectus. CIRENCESTER, 1886–90.

Civil Engineering as applied to Agriculture and Estate Management. BAGOT (A. C.), 1885.

Climate in connection with Husbandry. LOVELACE, 1848.

Colorado, Agricultural College. COLORADO, 1883.

—— Experiments in the Farm Department. BLOUNT, 1887.

—— As an Agricultural State. PABOR, 1883.

Course of Agriculture. BUFFON (N. de), 1852.

Cultivation of the soil, with special reference to the question of water-level. KAISER (O.), 1883.

Cyclopædia. MORTON (J. C.), 1869.

Depression in Agriculture: its causes and remedy. ROSS (O. C. D.), 1885.

Downton College. Prospectus, Work, Examination Papers. DOWNTON, 1885–90.

Effect of thunderstorms on trees and ligneous plants. COLLADON, 1872.

Egypt. PAPONOT, 1884.

—— Ancient Egyptians. HIRT, 1815.

Experiences. KUHLMANN, 1847.

Farm products moved as mail matter at a uniform rate for all distances. LUBIN, 1893.

Farm Homesteads of England. DENTON (J. B.), 1864.

AGRICULTURE—*continued.*

Farming (Modern), outlines of. BURN (R. S.), 1865–74.
Farming Essays. DAVIS (H.), 1855.
Formation of a National Agricultural Institution. HANDLEY H. (1838).
France. GOURCY, 1849, '51. Map. DELESSE, 1862.
—— Hydraulique Agricole. FRANCE, 1885, p. 435.
—— Review of Agricultural Statistics. LOVELACE, 1848.
Great Britain. Steam Farming in Great Britain and the Colonies. ADAMS (W. B.), 1850.
—— Present and future prospects of farming in. THOROLD (W.), 1849.
How to obtain good and cheap beef and unfailing crops. MACBAY, 1866.
Hungary. TÜRR, 1881
Husbandry. PLAT, 1653.
India. Agricultural Reform. HUME (A. O.), 1879
—— Farming in India. GREENAWAY 1864.
Ireland. County of Armagh. LINDSAY (H. L.), 1836.
Italy. Annali di Agricoltura. ITALY, 1886-88, p. 146.
Kansas State Board of Agriculture Report. KANSAS, 1881.
Land Question. AVELING (T.), 1880.
Laying down land to permanent grass. FAUNCE-DELAUNE, 1882.
Luxemburg. Best means of fertilising the waste lands of the Ardennes. LE DOCTE, 1849.
Madras. Report on Agricultural Exhibitions, 1856. INDIA, p. 122.
Mathematical foundations of the science of husbandry. FRANCKE, 1892.
Milan. Meadow lands. BERRA, 1822.
Mysore, agricultural condition. HARMAN. (1877.)
New Zealand Agricultural Company. Prospectus, 1879. NEW ZEALAND, p. 413.
Paris, environs. Map. DELESSE, 1874.
—— Exhibition, 1867. SALVIATI, 1867-68.
Points in Connection with Vegetation. GILBERT (Sir J. H.), 1876.
Potato Disease. COXWORTHY, 1847.
Rate of Wages influenced by the cost of transportation on farm products. LUBIN, 1894.
Retrospect of . . . Agricultural Discoveries. PERIODICAL PUBLICATIONS, p. 23.
Rothampsted Agricultural experimental station. ROTHAMPSTED, 1877.

AGRICULTURE—*continued.*

Rothampsted Agricultural experimental station. Amount of Water given off by Plants during their growth.
LAWES (Sir J. B.), 1850.

—— Composition of Soils. LAWES (Sir J. B.) and Gilbert, 1885.

—— Determination of Nitrogen in the soils of some of the Experimental Fields.
LAWES (Sir J. B.), and Gilbert, 1883.

—— Experiments on Ensilage.
LAWES (Sir J. B.) and Gilbert, 1886.

—— Experiments on the growth of Wheat.
LAWES (Sir J. B.) and Gilbert, 1885.

—— Experiments on Barley, Leguminous Crops, Root Crops.
GILBERT (Sir J. H.), 1886–89.

—— Field Experiments conducted on the farm of J. B. Lawes, 1876, &c. LAWES (Sir J. B.).

—— New determinations of Ammonia, Chlorine and Sulphuric Acid in the Rain Water.
LAWES (Sir J. B.), Gilbert and Warington, 1883.

—— Valuation of Unexhausted Manures.
LAWES (Sir J. B.) and Gilbert, 1886.

Rural buildings and industries. BAYER Y BOSCH, 1889.

Rural Economy, general principles. BOUSSINGAULT, 1843–44; BUFFON (N. DE), 1852.

Seine et Marne, Map. DELESSE, 1880.

Series of agricultural papers. ANONYMOUS, 1867–69, p. 52.

Société des Agriculteurs de France. CHABRIER, 1871.

Spain, 1861, '66, '67. SPAIN, p. 234.

—— North. GOURCY, 1851.

Stations. DURAUD-CLAYE, 1878.

Thorough Cultivation. COTTON (Sir A.), 1887

Tillage a substitute for Manure. BURNETT, 1859.

Transmission of goods. PERELS, 1882.

United States of America Agriculture, Grasses, Soil, etc. See UNITED States, pp. 339, &c.

Utah Agricultural College Experiment Station. Bulletin and Report, 1894. UTAH Agricul. Coll. Add 537.

Valuation of tenant's right on entering and quitting farms.
BAYLDON (J. S.), 1827.

Watering Meadows. BOSWELL (G.), 1790.

Wisconsin Agricultural Experiment Station Farm. Fluctuations in the level and rate of movement of ground-water.
KING (F. H.), 1892

Wyoming, Agricultural Survey. WYOMING (State of), 1893.

Yester deep Land Culture. STEPHENS (H.), 1855.

AGRICULTURE (AGRICULTURAL BUILDINGS).

Agricultural Buildings, Designs for. WAISTELL (C.), 1827.

AGRICULTURE (AGRICULTURAL CHEMISTRY).

Agricultural Chemistry. COX (G.), 1844; DAVY (Sir H.), works, vols. 7 and 8; DAVY, 1813; DUNDONALD, 1803; FOWNES (G.), 1859; JOHNSTON (J. F. W.), 1847; LIEBIG, 1842; MACIVOR, 1870; NESBIT, 1856; PETZHOLDT (Alex.), 1844.

Agricultural Chemistry and Geology. JOHNSTON (J. F. W.), 1847.

—— Application to Agriculture and Physiology. LIEBIG, 1842.

—— Course of Lectures. MACIVOR, 1870.

Chemistry of Soils. SCOFFERN (J.), 1862.

Dairy Farming. United States Milk Fermentations and their relations to dairying. UNITED States, 1892, p. 243.

Drainage (Thorough) and deep Ploughing. SMITH (James), of Deanston, 1844.

Laboratory Guide for Agricultural Students. CHURCH (A. H.), 1882.

Nitrification. WARINGTON (R.), 1884.

Vegetable Chemistry and Physiology. LE DOCTE, 1849.

AGRICULTURE (AGRICULTURAL IMPLEMENTS).

Agricultural Locomotives. AVELING, (T.), 1878.

Agricultural Mechanism. WILLIAMSON (T.), 1840.

Cultivation of Land by Steam-power. HOWARD (J.), 1869.

Electrical energy applied to Agriculture. SIEMENS (Sir W.), 1881, p, 198.

Common, seed-furrow and draining ploughs. RANDALL, 1764.

Derby, Agricultural Implements exhibited at. JOHNSON (C. W.) and Hare, 1843.

Improvements in Machinery for digging Land. CROSSBY and Carey, 1881.

Machinery (Agricultural). BEVAN (G. P.), Industries, vol. 10; FRITZ, 1880; JOURDIER, 1856; PERELS, 1880.

Mechanics relating to Agriculture. PERSON (C.), 1802.

New Engine for Ploughing. EVELYN, 1670.

Plough, construction of. BAILEY (John), 1795.

Plough-wright's Assistant. GRAY (A.), 1808.

Plough (Steam), Heathcoat's. BLACKLOCK, 1837.

Portable Engines and Threshing Machines. GRIMALDI, 1880, '86.

Portable Farm Railway. An account of, and uses and application of. WESTLY (W. K.), 1860.

AGRICULTURE (AGRICULTURAL IMPLEMENTS)—*continued.*
Reaping Machines. Specifications of English patents for. COMMISSIONERS, p. 283; WOODCROFT (B.), 1853.
Rural Engineering. MANGON, 1875.
Steam Cultivation. Smith *v.* Fowler. HUTCHINSON (S.), 1865.
Steam engines (portable), report of the trials. BRAMWELL and Anderson, 1887.
Steam Cultivation at the Watling Works, Stony Stratford, Bucks. HUNT (R.) 1863.
—— Power, application of, to Cultivation. FOWLER (J.) and Greig, 1865.
Tools, Machinery, &c. HILL (J. W.), 1880.

AGRICULTURE (LIVE STOCK). United States Cattle, their diseases, &c. UNITED STATES, 1885–93, pp. 341, 342.
—— Report from Committee to examine the petition of Breeders of Sheep on Act of Edw. VI., 1755. PARLIAMENTARY..Papers, p. 513.

AGRICULTURE (MANURE). Deposits of Guano in the desert of Atacama. PISSIS, 1878.
—— Principles and use of Artificial Manures. LIEBIG, 1845.

AGRICULTURE (SOILS.) LAWES (Sir J. B.) and Gilbert, 1885.
Alluvia of Babylonia and Chaldæa. BEKE, 1839.
Clay lands and loamy soils, rudimentary treatise. DONALDSON (J.), 1852.
India. Deterioration of Lands in India from the presence in the Soil of Reh. INDIA, 1864, p. 99.
Influence of Water on the temperature of Soils. PARKES (J.), 1844.
Modern High Farming. A treatise on soils, plants and manures. WYATT (F.), 1886.
Nitrogen as nitric acid in the Soils and subsoils of some fields. LAWES (Sir J. B.), Gilbert and Warington, 1883.
Physical properties of Soils in their relation to moisture and crop Distribution. WHITNEY (M.), 1892.

AIR.
Aerial Vibration in Cylindrical Tubes. HOPKINS (W.), 1833, App. 562.
Air and its relations to Life. HARTLEY, W. N., 1876.
Air as a fuel, or petroleum, etc., utilized by carburetting air. ROSS (O. C. D.), 1874, p. 131.
Atmosphere. WOODHEAD (G.), 1852.
—— Constitution. GYLDEN, 1866.

AIR—*continued.*

Atmosphere. Nature and properties. DOWNIE, 1801.

—— Power of the intercepted pressure of, and its application to bakeries, iron-works, &c. PRATT, 1844.

Atmospheric Air, changes produced on, by Respiration. ALLEN (W.), and Pepys, 1808.

—— Change of elastic force of a constant volume of, between 32° F. and 212° F. STEWART (BALFOUR), 1863.

—— Different modes of using the elasticity of, as a motive force on railways. CRELLE, 1846.

—— Pressure, letter on the proposed plan of travelling by. RICARDO (M.), 1827.

—— Vibrations in. AIRY, (Sir G. B.), 1868, p. 19.

Experiments made to determine Resistance of Air to the surface of bodies moved through it. HUTTON (C.). 1787, App. 562.

Flow of Air, Movement of atmospheric air in Tubes. CHOWNE, 1855.

Modifications of the Atmosphere. LUC, 1772; DELUC, (J. A.), 1772, App. 553.

Movements of the Atmosphere. GULDBERG and Mohn, 1876–80.

Observations. PRIESTLEY, 1779–86.

Purification. Alkaline permanganates. CONDY, 1862.

—— Preventible causes of impurity in London Air. GALTON, 1880.

Relations of Air to heat and moisture. LESLIE (Sir John), 1813.

Refraction of an Atmosphere nearly resembling that of the Earth. Finite and exact expression for. YOUNG (Dr. T.), 1824.

Spring and weight of the Air, Defence of the doctrine touching. BOYLE (Hon. R.), 1662, App. 549, 1682.

—— Examination of Hobbes's Dialogus physicus. BOYLE (Hon. R.), 1662, '69; App. 549, 1682.

Thermal and mechanical Properties of Air and other permanent gas, subjected to expansion and contraction. THURSTON (R. H.), 1874, p. 310.

AIR (COMPRESSED). BIADEGO, 1886; BIRMINGHAM Compressed Air Company, 1886; HANARTE, 1879; PERNOLET (A.), 1876.

Application of, to Ventilation and to various other purposes. MONDESIR and others, 1870.

Apparatus for mechanical perforation. John Cockerill Society at Seraing. SANTIAGO, 1814. Add 532.

As a motive power. ANDRAUD, 1890.

—— Theoretic and practical value of compressed air motors. COMPAGNIE Continentale, 1886.

AIR (COMPRESSED)—*continued.*

Compressed Air Engines. HAUARTE, 1879.
Compressed air installations and new devices for distributing mechanical power. PROELL, [1891].
Compressed Air Power and Compressed Air Engine. PARSEY, 1851.
Disease due to compressed air, new theory. MOIR, 1891.
Dufresne Sommeiller, use by. FROSSARD DE SAUGY, &c.;
Efficiency of air-compressors practically considered. WILLIAMS (Joseph), 1890.
Elementary treatise. COSTA, 1888.
Loss in conduit pipes. LEDOUX, 1892.
Motive force. GOUILLY, 1890.
Motive Power scheme for supplying Birmingham. BIRMINGHAM, 1883, 1886.
Motive Power System. STURGEON (J.), 1888.
Project for a Municipal compressed-air central station. PROELL (R.), 1890.
Thermotic effect of the compression and expansion of air. SMYTH (C. P.), 1860.
Tube propulseur Hallette. HALLETTE, 1846. Experiments at Arras. HALLETTE, 1845.
Varieties of temperature of compressed air. ANONYMOUS, 1886, p. 60.
Works executed by its means. HERSENT, 1889.

AIR ENGINES. BOURNE (J.), 1878; Buckett's Patent Caloric Engine. LATHAM (E.), 1883; Ericsson's Caloric Engine. SARGENT (J. O.), 1844; Experiments. TRESCA (H.), 1861; JOULE, 1852.
Air Expansion Engines. REDTANBACHER, 1853.
Determination of air consumption in air motors. PROELL, [1891].
Operation of Air Engines. LAWRIE, 1861.
Patent Locomotive and Stationary Air Engines. PARSEY, 1845.
Text book. DONKIN (B.), jun., 1894.

AIR-PUMP. See PUMPS.

ALCHEMY. FOORD, 1882.

ALCOHOLIC LIQUORS. Manufacture and distillation. DUPLAIS, 1871.

ALKALI TRADE. History, products and processes. KINGZETT, 1877.

ALLOYS. MATTHIESSEN, 1867.
Alloys used for Coinage. ROBERTS-AUSTEN (W. C.), 1884, p. 119.
Aluminium Alloys. Heroult process of smelting. DEWEY (F. P.), 1890.
Aluminium-steel. HADFIELD, 1890.
Bronze Alloys for Engineering Purposes. NURSEY, 1884.
Copper-Tin Alloys. Report of Committee on a preliminary investigation of their properties. THURSTON (R. H.), 1879, p. 310.
Copper and Zinc Alloys. STOREY (F. H.), 1860.
Founding of Alloys. KIRK (E.), 1878.
Gold. Observations on different alloys of, specific gravity, etc. HATCHETT (C.), 1804. App. 561.
Hadfield's Patent Manganese Steel. HADFIELD, 1884, '93.
Iron and Chromium etc., Alloys of. HADFIELD, 1892.
—— Alloys. HADFIELD, 1893.
—— Osmond's inquiry on the critical point of iron alloys. MÜLLER, F.C.G., 1891.
Metallic Alloys. KRUPP and Wildberger, 1889. Manufacture. GUETTIER, 1872.
Nickel and Iron, Magnetic properties of. HOPKINSON (J.), 1890.
Specific gravities of Alloys. CRACE-CALVERT and Johnson, 1859.

ALMANACS. ADAN, 1879.
Australian Almanac for 1873. SHERRIFF (J. L.), 1873.
Brett's Auckland Almanac. PERIODICAL PUBLICATIONS, p. 12.
British Almanack. PERIODICAL PUBLICATIONS, p. 12.
Companion to the Almanac. PERIODICAL PUBLICATIONS, p. 13.
Horologer's Almanack for 1852. BORSENDORFF (L.), 1851, App. 549.
Nautical Almanac, 1834, etc. PERIODICAL PUBLICATIONS, p. 20.
Pugh's Queensland Almanac. PERIODICAL PUBLICATIONS, p. 22.
Railway, Mining, Insurance and Commercial Almanack, 1866–69. PERIODICAL PUBLICATIONS, Add 528.
Walch's Tasmanian Almanac. PERIODICAL PUBLICATIONS, p. 26.

ALPHABETS of Ancient and Modern Languages. BALLHORN, 1861.

ALTITUDES. Africa. Altitudes above Sea Level of places in South Africa south of 20° S. latitude. GAMBLE, 1886.
United States, Dictionary. GANNETT, 1884, '91.

ALUMINIUM. STE.-CLAIRE-DEVILLE (H. E.), 1859; STYFFE, 1892.
Aluminium Alloys. Heroult process of smelting. DEWEY (F. P.), 1890.
Chemical analysis. HUNT (A. E.), &c., 1892.

ALUMINIUM—*continued.*

History, properties, etc. RICHARDS (J. W.), 1887.
Manufacture and uses in engineering. HUNT (A. E.), 1892.
Production by Electrolysis and Electro-fusion. THWAITE (B. H.), 1891, p. 312
Properties. HUNT (A. E.), &c., 1890
—— uses and processes of production. HUNT (A. E.), 1891

AMMONIA. Production of, from the Nitrogen of Minerals. BEILBY, 1884–85.

AMMUNITION. Treatise on the projectiles, charges, fuses in use for land and sea service. BROWNE (C. O.), 1870.

ANATOMY.

Comparative Anatomy. Introductory Lecture to Course. KIDD (J.), 1826.
Hand (The), its mechanism and vital endowments as evincing design. BRIDGWATER Treatises, 4.
Lumbar Curve in Man and Apes. Cunningham Memoirs, vol. 2. ROYAL Irish Academy, 1880–88, p. 141.
Osteology of *Lanius Ludovicianus excubitorides.* SHUFELDT (R. W.), 1881.
Osteology of the North American Tetraonidæ. SHUFELDT (R. W.), 1881.
Proportions of the Human Figure. BONOMI (1856).
Sympathetic Nervous System. GASKELL, 1886.

ANCHORS:—

Admiralty Anchor Scandal. TROTMAN (J.), 1874.
Improved patent small-palmed Anchor. RODGER (Lieut. W.), R.N., 1855.
Patents for their improvement. RODGER (Lieut. W.), R.N., 1830.
Porter & Co.'s patent anchor, Reports on. PORTER (W. H.) & Co., 1842, 1843.
Proving-house for Chain and Anchors, 1866. LLOYD'S Register.
Reports from naval officers relating to Anchors and Ships' Ground Tackle since 1853. PARLIAMENTARY.. Papers, p. 469.
Ships' Anchors. COTSELL, 1856.
See also CHAIN CABLES.

ANCIENT LIGHTS. KERR (R.), 1868. Law and Science. Cox (H.), 1869.

ANEMOMETER.

Anemometer for registering the direction of the wind, etc. ROBINSON (T. R.), 1851.

Results of Observations made with a new Anemometer. WHEWELL (W.), 1837.

Self-registering Anemometer. OSLER, 1840.

See also WIND PRESSURE.

ANGLING. Salmonia, or days of Fly-fishing. DAVY (Sir H.) Works, vol. 9.

ANIMAL POWER. Animal Machine. Land and aerial locomotion. MAREY, 1873; Animal Mechanics. HAUGHTON (S.), 1873; Human Beast of Burden. MASON (O. T.), 1889; Mechanics of the Human Machine. WEBER (Wilhelm), 1892–94.

ANIMALS. Animal Sanatory Institution, Man's injustice to Animals. BROWN, 1888, p. 187.

ANNEALING. Laws of, and their consequences. LE CHATELIER (A.), 1890.

ANNUALS.

Statesman's Year Book. PERIODICAL PUBLICATIONS, p. 25.

Year Book of Facts in Science and Art. TIMBS (J.), 1839–79.

ANNUITIES. RANKIN (R.), 1830. Errors of writers in their valuation of half-yearly and quarterly payments. ROUSE (W.), 1816.

Government Annuities, Instructions for the establishment of Parochial Societies for granting. ANONYMOUS, 1837, p. 47.

See also INSURANCE (Life).

ANTHROPOLOGY. ANTHROPOLOGICAL Society.

British Guiana, Indians of. IM THURN (E. F.), 1883, Add 509.

Mankind, Study of. MUSEUM of Mankind, 1842.

Pamunkey Indians of Virginia. POLLARD (J. G.), 1894, Add 529.

ANTIMONY.

Antimony manufacture. SOPWITH (T.) and Richardson, 1864.

APOTHECARIES.

Bill for regulating the practice of surgeon-apothecaries, etc. SINCLAIR, M., 1840.

APPRENTICESHIP.

Advantages of Apprenticeships. Letter. PLAYFAIR (W.), 1814, App. 572.

AQUEDUCTS. ANONYMOUS (Canals), p. 41. Patent for Invention in the art of constructing. JORDAN (James), 1797.

Alexandria Canal. Aqueduct across the Potomac River. Construction of the Piers. TURNBULL (W.), 1873.

Barton. BAZLEY, 1859.

Florentine (New) Aqueduct. FLORENCE, 1893.

New York Croton Aqueduct. Description. SCHRAMKE (T.), 1846.

—— Illustration. TOVER (F. B.), 1843.

Potomac Aqueduct. Construction. POTOMAC Aqueduct, 1838.

Quebec, Amelioration of. BAILLAIRGÉ, 1881.

Rome, Aqueducts. FABRETTUS, 1680; FRONTINUS, 1722. Aqua Martia (Quintus Martius Rex). BORGNANA, 1861.

—— Acquidotto Claudio. ABATE, 1864.

Roquefavour, Bridge Aqueduct of, on the Canal of Marseilles. RENNIE (G.), 1855, p. 100.

Spoleto. CLERICETTI, 1854.

ARBITRATION. PRASCHKAUER, 1889.

Law of Arbitrations and Awards. REDMAN (J. H.), 1872.

Practical Arbitrator designed for lay Arbitrators. JACKSON (C.), 1879.

ARCHÆOLOGY. Archæology, place of, in Science. KENWARD, 1877.

Anglo-Saxon and Frankish remains. SMITH (Chas. R.), 1852.

Barrow near Driffield. "Kemp Hors." MORTIMER, 1876.

Bengal. Report on Archæological Survey of, 1887. INDIA, Add 510.

Brigg. Ancient Raft (Prehistoric Boat), recently found at, in Lincolnshire. Description. THROPP (J.), 1886, '88.

British Archæological Association. Speeches at Meetings. DUNKIN, 1845.

Denmark. Primeval Antiquities of. WORSAAE (J. J. A.), 1849.

Egypt (Upper). Antiquities of. Report of the Commission of Arts to Bonaparte. EGYPT, 1800. Add 498.

India. Archæological Survey. CUNNINGHAM (Sir A.), 1871; Reports 1862–65. INDIA, p. 99.

—— The Stupa of Bharhut. CUNNINGHAM (Sir A.), 1879.

Ireland. Early Habitations of the Irish, especially the Crannoges. WYATT (M. D.), 1858.

Italy and France. Monuments of Antiquity. WIEBEKING (C. F. von), 1838–9.

London. Catalogue of Antiquities found at the New Royal Exchange, an account of their discovery, and some remarks, etc., on Roman London. TITE (W.), 1848.

ARCHÆOLOGY—*continued.*

Lymne. Excavations made on the site of the Roman Castrum at Lymne, in Kent, in 1850. SMITH (Chas. R.), 1852.

Madras. Memorandum on a couple of stones found in the Cumbum Taluq of the Kurnul District. PARRY (J. W.), 1883.

Maidstone. Antiquities of, and the Polychromy of the Middle Ages. WHICHCORD (J.), 1860.

Poona District. Archæological Antiquities of the, 1883. INDIA, p. 129.

Rocky Mountains. Catalogue of the Prehistoric Works east of. THOMAS (Cyrus), 1891.

Rome. PARKER (J. H.), 1876–83.

Strathnairn and Inverness, Stone circles. FRASER (J.), 1885.

ARCHES. PHIPPS, 1881; SLACKE (W. R.), 1878.

Bridge Arches, establishment of, looked at from the point of stability. VILLARCEAU (Y.), 1853.

Construction and properties of Arches. ATWOOD, 1801–1804.

Construction of Oblique Arches. HART, J., 1839.

Constructing (Art of) Oblique Arches with spiral courses. DONALDSON (W.), 1867.

Construction in arches, piers, buttresses, Principles of. BLAND, 1867.

Direction of the joints in the faces of oblique arches. AIRY (Sir G. B.), 1862, p. 20.

Equilibrium. DUPUIT, 1870; GWILT, 1826; MOSELEY, 1835.

Equilibrium diagram. Arches in Masonry and trussed frames. CAVALLI, 1859.

Iron Arches. Notes. KERNOT, 1885.

Iron as the constituent material for arches of a large span. WHITE (John), 1832.

—— Theory of the continuous arch. AIRY, W., 1870.

Improved method for setting out gauged arches. BUCKLE, 1886.

Line of equal Horizontal Thrust in Arches. BARLOW (W. H.), 1846.

Modes of drawing the different kinds of arches made use of in building. LALL (K), 1853.

Nature and properties of. GADSDON, 1739.

Oakley Arch, a construction of extreme skew to carry a railway embankment over another railway. CROWELL (J. F.), 1890. Add. 494.

Pressure of circular barrel-vaulting on its centering. CULMANN (K.), [1871].

Properties of Arches, and their abutment piers. WARE (S.), 1809.

ARCHES—*continued.*

Segmental arches, two-nosed catenaries and their application to the design of. ALEXANDER (T.), 1888.
Skew Arches, advantages and disadvantages. HYDE (E. W.), 1875.
Stability in the well proportioned Arch, various elements of. WOODBURY (D. P.), 1858.
Stability of Arches. SNELL (G.), 1846.
Stone Arches. PERRONET, 1793.
Tables for Arches. ROBERTSON (F.), 1871.
Theory of Arches. ALLAN, W., 1874.
Theory of solid and braced elastic arches. CAIN, 1879.
Thrust of. PRESSE (J. A. C.), 1854.
Treatise on the Oblique Arch. NICHOLSON (P.), 1846.
Trusses and Arches analysed. GREENE (C. E.), 1884–90.
See also BRIDGES.

ARCHITECTS.

Collegio degli Ingegneri ed Architetti. NAPLES. Add. 522.
Congresso degli Ingegneri e degli Architetti Italiani. CONGRESSO, 1884; PINI 1876.
Education and character of the Architect. DONALDSON (T. L.), 1847.
Professional practice. NOBLE (J.), 1836.
Registration of Architects. SETH-SMITH (W. H.), 1886.

ARCHITECTURE (GENERAL). AMATI, 1811; BAROZZIO, 1840; CATANEO, 1554; CLEGG (S.), jun., 1849, '52; DURAND, 1823–5; EVELYN, 1664, 1706; GIBBS (James), 1728; PALLADIO, 1738, '85, '86; PHILANDER, 1544; SERLIO, 1545; REYNAULD (C.), 1875–8; SMITH (Thomas R.), 1880.
Abuses of the present system of competition in Architecture. AUSTIN (H.), 1841.
Academy Architecture and Annual Architectural Review, 1889. PERIODICAL PUBLICATIONS, p. 8.
American Architect and Building News, vol. 32. PERIODICAL PUBLICATIONS, p. 9.
American Institute of Architects. AMERICAN INST. OF ARCH.
Ancient Architecture and Engineering. FIDLER, 1892.
—— Restored and improved. LANGLEY (B. & T.), 1741–42.
Annual Retrospect. BURNELL, 1862.
Architect (The). PERIODICAL PUBLICATIONS, p. 11.
Architect's Compendium. SEARS (J. E.), 1888–90.
Architect's Legal Handbook. JENKINS and Raymond, 1889.
Architect's Register. PERIODICAL PUBLICATIONS, p. 11.

ARCHITECTURE (GENERAL)—*continued.*

Architects, ancient and modern. MILIZIA, 1781.

Architectural Album. SCHINKEL (C. F.), 1838.

Architectural Design. Cantor Lectures on its Elements. STATHAM (H. H.), 1888.

Architectural Examples in Brick, Stone, Wood and Iron. FULLERTON, 1890.

Architectural Iron Work. FRYER (W. J.), 1876.

Architectural Magazine, etc. PERIODICAL PUBLICATIONS, p. 11.

Architectural maxims and theorems. DONALDSON (T. L.), 1847.

Architectural medals of classic antiquity. DONALDSON (T. L.), 1859.

Architectural notes: extracts from various authors. TELFORD (T.), 1810, p. 286.

Architecture as applicable to military buildings. SEDDON (J. P.), 1874.

Arkansas Society of Engineers, Architects, and Surveyors. Transactions. ARKANSAS SOC., 1887.

Bayerischer Architekten und Ingenieur Verein. BAYERISCHER, 1874–77.

Bill for Registration of Architects, 1889, '90. PARLIAMENTARY..Papers, p. 465.

British Architect. PERIODICAL PUBLICATIONS, p. 12.

Catalogue of Modern Books on Architecture. TAYLOR (I. and J.), 1820, 1823.

Churches, Architecture of. DEMANET, 1847.

Civil Architecture. ALDRICH, 1789. Science of engineers in the management of the works. BÉLIDOR, 1739, 1789. Treatise. CHAMBERS (Sir W.), 1768. Decorative part of. CHAMBERS (Sir W.), 1862. Masonry. DENFER, 1891. Theoretical and practical, etc. WIEBEKING (C. F. von), 1827–8.

Civil Engineer and Architect. PERIODICAL PUBLICATIONS, p. 13.

Classic and early Christian architecture. SMITH (Thomas R.) and Slater, 1882.

Conferences of Architects, 1871 and 1887. ROYAL Inst. of British Architects.

Construction of Working Drawings. WALKER (T. L.), 1841.

Cottage, lodge and villa Architecture. AUDSLEY, 1869.

Cottages and other buildings. Sketches. SHAW (R. N.), 1878.

Course of Architectural drawing. ARMENGAUD (J. E.) & Co., 1853.

Course and current architecture. HUGGINS (S.), 1863.

Designs (Architectural), Collection of. SCHINKEL (C. F.), 1858.

Designs of Ornamental Gates, Lodges, Palisading, etc. WEALE (J.), 1841.

Deutsche Bauzeitung. PERIODICAL PUBLICATIONS, p. 13.

ARCHITECTURE (GENERAL)—*continued.*

Dictionary, Architectural and Engineering. NICHOLSON (P.), 1835, '54.

Dictionary of terms used in Architecture, building and construction. WEALE (J.), 1849–50 and 1875.

Dictionary of Architecture. ARCHITECTURAL Publication Society, 1853–1892.

Dictionary of Architecture, Civil and Hydraulic. AVILER (A. C. D.), 1755.

Dictionary of Architecture, 11th to 16th cent. VIOLLET-LE-DUC, 1858–68.

Dictionary. Glossary of Terms. ANONYMOUS, 1850, p. 46; BREES, 1853; PARKER (J. H.), 1869.

—— Meaning of Words used by Vitruvius. BALDUS, 1612.

—— Architecture of the Middle Ages. BRITTON, 1838.

Discourse. DONALDSON (T. L.), 1842.

Domestic Architecture. CHATEAUNEUF, 1839.

École Centrale d'Architecture. Paris. The Amphitheatre in 1865 and 1866. PARIS, p. 453.

École Spéciale d'Architecture, Paris. Publications, 1885, &c. PARIS, pp. 455–6.

Elements of Architectural Criticism. GWILT, 1837.

Elements of Architecture. MILNE (James), 1812; WOTTON (Sir H.), 1624.

Encyclopædia. GWILT, 1851, '67, '81.

Encyclopédie d'Architecture. PERIODICAL PUBLICATIONS, p. 15.

Engineering and Architectural College. ROME, 1880–85 and 1886.

Essays. ARCHITECTURAL SOCIETY, 1808–10.

—— Essays, 1863–73. Habitations of Man in all ages, 1876. How to build a house, 1874. VIOLLET-LE-DUC.

Fine Arts Journal (containing article on "A new system of Architecture," by Pickett). PERIODICAL PUBLICATIONS, p. 15.

Five Orders. NORMAND, 1824; PERRAULT (C.), 1722; THIERRY (X.), 1843.

Geometry and Optics of Ancient Architecture. PENNETHORNE (J.), 1878.

Gothic Ecclesiastical Architecture. BLOXAM (M. H.), 1843.

—— Origin and progress. MÖLLER (G.), 1824.

Grammar of House-planning. ANONYMOUS, 1864, p. 46.

Handbook. FERGUSSON (J.), 1855.

Handbook of Formulæ, Tables and Memoranda. HURST, 1882.

Handbuch der Baukunde. ANONYMOUS, 1885, p. 46.

Historical essay. HOPE (T.), 1840. Analytical Index. CRESY, 1863.

ARCHITECTURE (GENERAL)—*continued.*

History. FERGUSSON (J.). 1865–67; FISCHER (J. B.), 1725; MEMES, 1834; RAMÉE, 1843; ROMBERG and STEGER, 1844.

Hülfswissenschaften zur Baukunde. ANONYMOUS, 1885, p. 47.

Hydraulic architecture. BÉLIDOR, 1737–53, 1819.

Influence on civilisation. WIEBEKING, 1819.

Jurisprudence, architectural. ELMES (J.), 1827.

Lectures. BARRY (E. M.), 1871, 1874, 1881; FERGUSSON (J.), 1862.

Manual of Gothic Mouldings. PALEY, 1845.

Mechanical Principles. MOSELEY, 1843, '55.

Mechanics of Architecture. TARN (E. W.), 1892; TARN, 1892, Add 535.

Mediæval Architecture. History of the Gothic Revival. EASTLAKE (Sir C. L.), 1872.

Metals. PICKETT, 1845.

Middle Ages. (Ramée.) LOVELACE, 1850.

Military Architecture of the Middle Ages. VIOLLET-LE-DUC, 1854.

Model designs for mansions, cottages, gates and stables. BURN (R. S.), 1860.

Modern Styles. FERGUSSON (J.), 1873.

Modern Villa and Cottage. ANONYMOUS, 1850, p. 49.

Moniteur (Le) des Architectes. ANONYMOUS, 1850, p. 49.

New forms for iron, slab, slate, hollow brick pottery, fire-proof timber, &c. PICKETT, 1849.

New instrument for delineating all the parts of the different orders of Architecture. REVESI BRUTI, O. R., 1737.

Pocket Book, Architects' and Contractors', for 1862, 3, 1867–1880. ANONYMOUS. Add. 481.

Pointed Architecture. SOLOYNS (E.), 1846.

Politecnico. Giornale dell'ingegneri, architetti civile, ed industriale. PERIODICAL PUBLICATIONS, p. 21.

Power of Form applied to Geometric Tracery. BILLINGS (R. W.), 1851.

Practical Architecture, outline of a course. PASLEY, 1862; ROGERS (F.), 1886.

Principles. NICHOLSON (P.), 1836; GARBETT, 1867; HOSKING, 1842.

Public Competitions for Architectural Designs. Report of the Committee. ROYAL Inst. of Brit. Arch., 1839.

—— Questions on Subjects connected with it. ROYAL Inst. of British Architects, 1835 and '42.

Religious Architecture in the Middle Ages. CAUMONT, 1841; PEYRÉ (J. F. A.), 1848.

ARCHITECTURE (GENERAL)—*continued.*

Retrospective view of the architectural principles of Schinkel and Bötticher. JACOBSTHAL (E.), 1890.

Restoration etc. and notes on historical monuments of France. VIOLLET-LE-DUC (E. E.), 1875.

Revue générale de l'Architecture. PERIODICAL PUBLICATIONS, p. 23.

Royal Architectural Museum. Catalogue and Report. ROYAL Architec. Museum, 1869, '77.

Rudiments. BURY (T. T.), 1849; GWILT, 1835, '39; LEEDS (W. H.), 1867.

Rudiments of Ancient Architecture. ANONYMOUS, 1821, p. 55.

School Architecture. ROBSON (E. R.), 1874.

Secular and domestic Architecture, present and future. SCOTT (G. G.), 1858.

Société Vaudoise des...Architectes. Bulletin. SOCIÉTÉ Vaudoise des Ingenieurs, 1876, etc.

Specifications of Works. BLENKARN, 1865.

State of Architecture in the Provinces. GODWIN, 1836.

Studies. BARKHAUSEN and Lauler, 1894. Add. 483.

Surveyor, Engineer and Architect. PERIODICAL PUBLICATIONS, p. 25.

Theatre (The), and the Architect. TRÉLAT (E.), 1860.

Town and Country Mansions and Suburban Houses. YOUNG (W.), 1879.

Tudor Architecture, Examples of. HUNT (T. F.), 1841.

Universal Architecture. SCAMOZZI (V.), 1615.

Villa and Cottage Architecture. BLACKIE (W. G.), 1868.

Works in Architecture. ADAM (R. and J.), 1778–9.

See also BUILDING.

ARCHITECTURE (SPECIAL).

Athenian Architecture. PENROSE (F. C.), 1851.

Australia (South), Architects Department. Return of Employés. SOUTH Australia, 1867, p. 227.

Belgium. Architecture. History. SCHAYES (A. G. B.), 1853.

Birmingham Architectural Association. BIRMINGHAM Arch. Assoc.

Bristol, St. Mary Redcliffe, Restoration of. WHISH (M. R.), 1842.

Cambridge and Eton Colleges, Architectural history. WILLIS (R.), 1886.

Christchurch Monastery, Canterbury, Architectural history of the conventual buildings of. WILLIS (R.), 1869.

English Architecture. DALLAWAY, 1806. 17th Century. ELMES (J.), 1823; VITRUVIUS, 1692–1826, p. 386.

ARCHITECTURE (SPECIAL)—*continued.*

English Architecture. Architectural Remains of the reigns of Elizabeth and James I. RICHARDSON (C. J.), 1838.

—— Cathedrals of England, France, and Italy; the Temples of Rome, Greece, and Sicily. TAYLOR (G. L.), 1870–72.

—— Domestic Architecture in. THOMAS (T. H.), 1851–59.

—— Ecclesiastical Architecture in England. PUGIN (A. W.), 1843.

—— Gothic Architecture in England. PUGIN (A.), 1821; PUGIN (A. and A. W.), 1850.

—— Mouldings of the six periods and the seven periods defined. SHARPE (E.), 1871, 1888.

England. Styles of Architecture in, from the Conquest to the Reformation. RICKMAN (T.), 1862.

European Architecture to the 17th century. TACCANI (F.), 1855.

France. VITRUVIUS, 1547–1684; Picardy and Normandy. WHEWELL (W.), 1842.

—— Architectural Sketches in France, the Netherlands, Germany, and Italy. CONEY, 1860.

—— Architecture of France and Italy, ancient and modern buildings. TAPPEN (G.), 1806.

—— In the Middle Ages. RAMÉE, 1843.

—— Architect's letters from France, Italy, and Greece. WOODS (J.), 1828.

—— French Civil Construction and Architecture. WATSON (William), Ph.D., of Boston, 1892.

Germany. VITRUVIUS, 1757.

—— German Churches. Architectural Notes on. WHEWELL (W.), 1842.

Gothic Architecture. MÖLLER (G.), 1836.

Greek. MAUCH, 1832–39.

Indian and Eastern Architecture. FERGUSSON (J.), 1876.

Italy (North). Brick and Marble in the Middle Ages; notes of a tour. STREET (G. E.), 1855.

—— Terra Cotta Architecture. (13th–15th cent.) OTTOLINI and Lose, 1867.

—— Italian Architecture. PORTER (T.), 1880; VITRUVIUS, 1521–1832.

—— Lombardy. CLERICETTI, 1869.

Jeypore Portfolio of Architectural Details. JACOB (S. S.), 1890; JACOB, 1894, Add 511.

Latin. VITRUVIUS, 1496–1867.

Lincoln Cathedral. Architecture and Sculpture of. WILD (C.), 1819.

London, Architecture in. What are the prospects for good. WISEMAN (Cardinal), 1864.

ARCHITECTURE (SPECIAL)—*continued.*

London, Architecture in. Architectural Improvement of western part. SMIRKE (S.), 1834.

—— Architectural Studies, 1862. TRELAT (E.), 1862.

—— Rebuilding of the Houses of Parliament. HOUSES of Parliament, 1835.

—— Palace of Westminster. Who was the Art Architect, Barry or Pugin? BARRY (Rev. A.), 1868.

Oxford. Architectural Antiquities in the neighbourhood of. SOCIETY for Promoting the Study of Gothic Architecture, 1846.

—— Gothic Architecture. Doors, windows, buttresses, pinnacles, &c. MACKENZIE and Pugin, 1835.

Paris, &c. Architecture and Public Buildings, their relation to School, Academy and State in Paris and London. WHITE (William Henry), 1884.

Paris, &c. Civil Architecture. Mansions, houses, &c., in the environs of Paris. KRAFFT, 1812.

Parthenon. Construction of the Parthenon. PENROSE (F. C.), 1846.

—— Proportions. JOPLING, 1855.

Pomeranian Coasts. Architectural travels. HAGEN (L.), 1887.

Spain. VITRUVIUS, 1787.

—— Architect's Note-book in. WYATT (M.D.), 1872.

—— Gothic Architecture in. STREET (G. E.), 1865.

Venice. MOTHES, 1859–60. Remarkable Edifices and Monuments. ZANOTTO (F.), 1858.

—— Stones of Venice. RUSKIN (J.), 1858–67.

ARCHITECTURAL DRAWING. Manual. GANOZ, 1856.

ARCTIC EXPEDITIONS. *See* GEOGRAPHY.

ARISTOCRACY, English. Thoughts on. TOMKINS (J.), 1835.

—— Letter to the author of Thoughts on the Aristocracy of England. JENKINS, 1835.

Nobility in France. LOVELACE, 1848.

ARMOUR. Facts concerning. ANONYMOUS, 1888, p. 45.

Defensive Armour. KING (W. R.), 1870.

ARMOUR PLATES.

Armour and its Attack by Artillery. BROWNE (C. O.), 1870.

Armour Fastenings. PALLISER, 1867.

Armour Plates. Results of Experiments, 1861–64, 1868. LEFROY.

ARMOUR PLATES—*continued.*

Guns *versus* Armour Plates. PARSONS (P. M.), 1863.

Iron and Steel Armour. GÜNTHER, 1868.

Iron Armour Plate Committee. Letter on Statements in Report. HAY (Sir J. C. D.), &c., 1877.

Modern Armour for National Defence. JAQUES, 1886.

Ordnance Plate, Improvements in, Specification of Patent. BLAKELEY, 1859.

Penetration of iron Armour-plates by steel shot. NOBLE (W. H.), 1866, 1867.

Resisting power of Armour plates and shot at high velocities. FAIRBAIRN (Sir W.), 1865, p. 403.

Steel as applied to Armour Plates. SMITH (Chas. W.), 1891.

Trial of Gruson's Chilled Cast-iron Armour at Spezia, 1866. LYLE.

"Wilson" compound steel-faced Armour plate, tested on board H.M.S. "Nettle." CAMMELL and Co., 1888.

See also SHIPS of War (Armour Plates).

ARMY.

Estimates. Reports of Select Committee, 1848, 1888. PARLIAMENTARY..Papers, p. 489.

Sanitation. GALTON, 1887.

—— Sanitary Condition of the Army (Crimean War), Report. ANONYMOUS (1860), p. 54.

Steam transport of Troops, inefficiency of over-sea. Abyssinian Expenditure. HOSKASON, 1870.

England and Wales. Application of money granted for Land Forces and Marines, 1746. PARLIAMENTARY..Papers, p. 465.

—— Military Organisation, 1860. PARLIAMENTARY..Papers, p. 465.

—— Sanitary Condition. Organisation of Military Hospitals, 1858. PARLIAMENTARY..Papers, p. 465.

—— Estimates, 1873, &c., 1887, &c. PARLIAMENTARY..Papers, p. 465.

—— Scientific Corps, best mode for training officers, 1857. PARLIAMENTARY..Papers, p. 466.

—— Royal Sappers and Miners. History. CONNOLLY, 1857.

—— 2nd Royal Surrey; or, Eleventh Regiment of Militia. DAVIS (J.), 1877.

Great Britain. Army Lists. New Annual Army List. HART (H. G.), 1893.

India. Bengal European Regiment, now Royal Munster Fusiliers. History. INNES, 1885.

—— Military Despotism. The Inniskilling Dragoon. LILLEY, 1863.

ARMY—*continued.*

India. Royal Commission on the Sanitary State of the Army. INDIA, 1863, p. 99.

—— Transmission of Troops to India. HOSEASON, 1858.

United States Army, etc. *See* UNITED STATES, p. 341.

See also MILITARY Art.

ARSENAL. Rock Island Arsenal. History from 1863 to 1876. FLAGER, 1877.

Spezia. Building and site. SARTI, 1860; Chief works executed there. SPEZIA, 1881.

ARSENIC, Bismuth and Wolfram. CHARLETON, 1884.

Quality of Arsenic in Perchloride of Iron. HOFMANN and Frankland, 1860.

ARTILLERY. BÉLIDOR, 1764; HARTMANN (J.), 1858; PIOBERT, 1859.

Accuracy of Artillery Fire. MACKINLAY, 1887.

Accident to the 12-inch breech-loading gun on board the "Collingwood." Report of Ordnance Committee, 1886. PARLIAMENTARY .. Papers, p. 493.

Archiv für die Artillerie- und Ingenieur-Offiziere, etc. PERIODICAL PUBLICATIONS, p. 11.

Armament (our new). LONGRIDGE, 1884.

Armourers of Her Majesty's Fleet. Instructions, 1885. PARLIAMENTARY .. Papers, p. 493.

Armstrong guns. ARMSTRONG, 1861; HALSTED (E. P.), 1862.

—— 'Big Will,' or 600-pounder Armstrong gun. Experiments at Shoeburyness. PRITCHARD (G. D.), 1864.

—— Armstrong gun compared with rifled cast-iron service guns. BRITTEN, 1862.

—— Original invention of an indispensable feature. BLAKELEY, 1859.

—— Armstrong and Whitworth Committee. Report. WHITWORTH (Sir J.), 1866.

Art of Artillery. SIMIENOWICZ (C.), 1729.

Artillery of the future, and the new powders. LONGRIDGE, 1891.

Artillery at the Exhibition of 1889. VEYRINES (P.), 1890.

Artillery operations of the Royal Artillery and Royal Naval Brigade before Sebastopol in 1854 and 55. ROYAL Artillery, 1859.

Ballistics. Attempt to deduce initial velocity from given range, elevation and time of flight. [redacted] (P.), 1860.

Big guns, our. [redacted]. 1886.

ARTILLERY—*continued.*

Breech-loaders. New B.-L. guns for sea service. Return of November, 1887. PARLIAMENTARY .. Papers, p. 494.

—— Breech-loaders. CAVALLI, 1856; PLOENNIES, 1867. Report 1864–68. PARLIAMENTARY .. Papers, p. 492.

—— Breech-loading small arms, heavy Ordnance, &c. American inventions and improvements. NORTON (C. B.), 1880.

Cannon. Properties of metals for cannon and the qualities of cannon powder. RODMAN (Capt. T. J.), 1861.

—— Short account of an improved. TREADWELL (D.), 1845.

Cast-Iron guns. BRITTEN, 1873.

Cast-Iron Ordnance, conversion and rifling chilled white iron projectiles. PALLISER, 1867.

Coiled wrought-iron inner tubes for Ordnance. Report of Select Committee, 1867. PARLIAMENTARY .. Papers, p. 493.

Comparative strength of Iron used in the manufacture of Mortars. EARDLEY-WILMOT, 1857.

Compound Ordnance. PALLISER, 1863.

Construction of Batteries for coast defences. RENNIE (G.), 1858.

Construction of Heavy Ordnance. HUNT (W. P.), 1881.

Construction of Ordnance. Recommendations of Ordnance Committee, 1885. PARLIAMENTARY .. Papers, p. 493.

Construction and Manufucture of Ordnance in the British Service, 1877–'86, '93. PARLIAMENTARY .. Papers, p. 493.

Construction of Walls to resist Artillery. COLLINSON (T. B.), 1864.

Conversion of smooth-bore cast-iron guns. PALLISER, 1870.

Creusôt. Its history and industry. HENNEBERT, 1890; VADOT (N.), 1875; WEYL (E), 1890. Paris Exhibition of 1878, PARVILLE.

Diagrams to illustrate the service and management of heavy Ordnance. BOXER, 1853–54.

Employment of quick-firing cannon in the Army and Navy. ROOS (G.), 1886.

Enfield and Whitworth Rifle Committee. Report, 1861. PARLIAMENTARY .. Papers, p. 492.

Engines of War, ancient and modern. WILKINSON (H.), 1841.

Equipment of Field Artillery. JOCELYN, 1881.

Ericsson's Destroyer and Submarine Gun. JAQUES, 1885.

Establishment of Steel Gun Factories in the United States. JAQUES, 1884.

Experiments on Cast-Iron for the Manufacture of Cannon, 1858. PARLIAMENTARY .. Papers, p. 482.

Factory, small arms, at Herstal (Liége). QUINAUX, 1892

ARTILLERY—*continued.*

Field Artillery on Service, with especial reference to that of an Army Corps. TAUBERT (A.), 1856.

15-inch gun. ABBOT (H. L.), 1868.

Firing of guns. CAVALLI, 1863.

French (modern), (St. Chamond, De Bange, Canet and Hotchkiss Systems). DREDGE, 1892.

Gatling Gun. Official Reports on Ordnance Gatling Gun. ANONYMOUS, 1878, p. 46. Gatling Gun for service ashore and afloat. FRANKLIN (W. B.), 1874.

Guns. SCOTT (M.), 1862, p. 177.

Guns and Artillery, Manufacture of. LONGRIDGE, 1855.

Guns of the calibre of 64 pounds and over, supplied to the Navy between 1870 and 1886. PARLIAMENTARY .. Papers, p. 494.

Gun Construction. Mechanical properties of steel with reference to. WOODBRIDGE (W. E.), 1875.

Guns (our). CARBUTT (Sir E. H.), 1886.

Guns and Gun Material. EDE (G.), 1889.

Guns of the Ironclad "Riachuelo" and their alteration to the Armstrong system. HUET de Bacellar Pinto Guedes, 1885.

Gun, Ram and Torpedo Manœuvres and Tactics. NOEL, 1874.

Guns and Steel. WHITWORTH (Sir J.), 1873.

Guns. The Story of the. TENNENT (Sir J. E.), 1864.

Gun-making in the United States. BIRNIE, 1888.

Gunnery. ANSTRUTHER, P. (1861; ROBINS (B.), 1761; SCOTT (M.), 1874, p. 176. Principle. SLADEN (Capt. J.), 1879. In 1858; rifles, cannon and sporting arms. GREENER, 1858.

—— Sea-gunner's companion. MOUNTAINE (W.), 1763.

Gunnery containing the determination of the force of gunpowder. ROBINS (B.), 1742, 1805.

Handbook of Artillery for the United States. ROBERTS (Joseph), 1875.

Heavy Guns, the connexion between their shape and durability. RIGG (A.), 1867.

—— For national defence. JAQUES, 1885.

Heavy Ordnance and the principles and processes of its construction. STONEY (Capt. F. S.), 1870.

—— Report on the effects of firing with it, from Casement Embrasures, &c. TOTTEN (J. G.), 1857.

—— For the Royal Regiment of Artillery. Instruction for the service and management of. TRENCH (C.), 1855.

—— In the United States. JAQUES, 1893.

Heavy rifled Ordnance. HICK, 1873.

—— Cast-iron and wrought-iron. BRITTEN, 1871. Construction. PALLISER, 1868.

ARTILLERY—*continued.*

High initial Velocities and effective Rifled Ordnance. RICHARDS (G.), 1863.
Hooped Cannons. Construction of. TREADWELL (D.), 1864.
Howitzers made at Krupp's Works. KRUPP (F.), 1857.
Hydrostatic batteries, to give a steady gun-deck at sea. ALLAN (A.), 1874.
Improved Ordnance. Construction of. TREADWELL (D.), 1862.
Instruction in Ordnance and Gunnery. BENTON, 1867.
Iron and Brass Ordnance in Continental States. Report of Commission, 1856. PARLIAMENTARY..Papers, p. 492.
Lectures. OWEN (C. H.) and Dames, 1861, 1865.
Lectures on Artillery and experiments on explosives. HARTMANN (J.), 1858.
Loading at Breech and at Muzzle, for military weapons. RICHARDS (Westley), 1863.
Manuel complet. PLESSIX, 1884.
Manufacture of guns. Siege of Paris. JORDAN (S.), 1878.
Marine Artillery. FRANCE, 1875, p. 435.
Mémorial de l'artillérie de la marine. PERIODICAL PUBLICATIONS, p. 19.
Memorial de artilleria. PERIODICAL PUBLICATIONS, pp. 18, 19.
Method of manufacturing Strong Cannon. BLAKELEY, 1858.
Military and Naval uses of very large shells. MALLET (R.), 1858.
Modern Guns and Smokeless Powder. RIGG (A.) and Garvie, 1892.
Modern practice of Artillery. HUTTON (C.), 1812.
Molecular Construction of the Metals of Ordnance. MALLET (R.), 1857.
Mortars. Art of making good. RAUCOURT DE CHARLEVILLE, 1828.
Muzzle loading rifled Ordnance, adaptation of the principle of the Minié rifle to cannon. BRITTEN, 1878.
Muzzle-loading *v.* breech-loading Field guns. Report of special Committee, 1871. PARLIAMENTARY..Papers, p. 493.
Muzzle and breech-loading guns. CAVALLI, 1862.
Naval Artillery. Aide-mémorie. LAFAY, 1850.
Naval guns and their supply. LONGRIDGE, 1889.
Naval guns and naval gunners. DAWSON (W.), 1872.
Naval Gunnery. DOUGLAS (Sir H.), 1851, 1855, 1860.
Naval Ordnance. SCOTT (Commander R.A.E.), 1861.
Naval Ordnance and Gunnery. COOKE (A. P.), 1880.
New method of constructing Cannon. BLAKELEY, 1858.
New Ordnance Material and Armour Material in Europe. BIXBY, 1886.
Nordenfelt Machine Guns. NORDENFELT, 1884.

ARTILLERY—*continued.*

Number and description of guns manufactured for H.M. ships 1886. PARLIAMENTARY..Papers, p. 493

Ordnance. DOWNING (D. F.), 1886; GIRDLESTONE, 1871; HOLLEY, 1865. Ordnance Administration. LONGRIDGE, 1885–1886.

—— Application of Wire to the construction of Ordnance. LONGRIDGE, 1884.

—— Hydro-pneumatic gear for siege and heavy ordnance. ANDERSON (W.), 1885.

—— Improvements in the construction of Ordnance. LONGRIDGE, 1856.

—— and Marine Material. KIRKLAND, 1874.

—— Method of converting ordnance invented by Col. Campbell. CAMPBELL (T. H.), 1864–65.

—— Modern Ordnance. LONGRIDGE, 1882.

—— Its progress at home and abroad compared. SCOTT (Com. R.A.E.), 1862.

—— Prussian system of field Ordnance in Belgium. BORMANN, 1861.

—— Rifled Iron and Steel Guns supplied by the War Department to the Naval and Land Service, 1859–1887. PARLIAMENTARY..Papers, p. 494.

Ordnance and Small Arms. Armstrong and Whitworth Committee. Evidence before Select Committee, 1854. Report, 1866. PARLIAMENTARY..Papers, p. 492.

—— Moncrieff Gun-carriages. Reports, 1875. PARLIAMENTARY..Papers, p, 493.

Pebble powder and cheaper guns. BRITTEN, 1873.

Power of modern artillery. DARAPSKY, 1870.

Practicability of constructing cannon of great caliber, capable of enduring long use with full charges. TREADWELL (D.), 1856.

Principles and Practice of Modern Artillery. OWEN (C. H.), 1871.

Progress and present position. LLOYD and Hadcock, 1893.

Proposal to change all the guns of the British Navy under and including 18 pounders for others of greater bore. ROBINS (B.), 1747.

Physical conditions involved in the Construction of Artillery. MALLET (R.), 1856.

Range finding for the service of artillery. CAMPBELL (J. R.), 1874.

Recent gunnery. MACKINLAY, 1885.

Report on experiments made in 1857 on two 12 pounder Krupp Howitzers of cast steel. KRUPP (F.), 1857. Add. 514.

Report on a Naval mission to Europe. Artillery material and construction. SIMPSON (E.), 1873.

ARTILLERY—*continued.*

Reports of Ordnance Select Committee, 1862–63, 1863–69. Director-General of Ordnance, 1871. Director of Artillery, 1871–83. Director of Artillery and Ordnance Committee, 1884–89, 1890, &c. PARLIAMENTARY..Papers, p. 492.

Revista de Artiglieria e Genio. PERIODICAL PUBLICATIONS, p. 24.

Revue d'Artillérie. PERIODICAL PUBLICATIONS, p. 23.

Rifle-Gun and Rotary Rocket. HALE, 1863.

Rifled Artillery, Papers on. WHITWORTH (Sir J.), 1869.

Rifled Cannon. CAVALLI, 1856; TREADWELL (D.), 1860.

Rifled Cannons in England. HARTMANN (J.), 1862.

Rifled Cast-Iron Guns. Report of Committee, 1863. PARLIAMENTARY..Papers, p. 492.

Rifled Cast-Iron Ordnance. BRITTEN, 1871.

—— Employed in the American War. BRITTEN, 1872.

Rifled Cast-Iron Service Guns. BRITTEN, 1862.

Rifled Guns, etc., and Fluid compressed Steel. WHITWORTH (Sir J.), 1872, '75.

Rifled Guns, Returns relative to, 1869–74. PARLIAMENTARY..PAPERS, p. 493.

Rifled muzzle-loading gun of 38 tons. Report of Committee on Explosive Substances, 1875. PARLIAMENTARY..Papers, p. 493.

Rifled Ordnance. BRITTEN, 1863, 1873, 1881; THOMAS (L.), 1859. Its construction and manufacture. STONEY (Capt. F. S.) and Jones, 1872.

Rights of Priority in the principles and methods of constructing Ordnance in superimposed rings with initial tension. MALLET (R.), 1860.

Royal Artillery and Royal Engineers Squabbles examined. ROYAL Artillery, 1856.

Royal Gun Factories. Report of Select Committee, 1868. PARLIAMENTARY..Papers, p. 492.

Schulz Artillery system. SCHULZ (Capt. —), 1883.

Science of gunnery. BLAKELEY, 1855.

Service of Artillery in time of War. ANTONI, 1789.

Ship-guns and sea-mortars. Precepts for the delineation of. ROBERTSON (John), 1775. App. 574.

Shoeburyness and the Guns. BARRY (P.), 1865.

Shots and Guns. Photographs of specimens. PALLISER, 1867.

Siege Artillery in the campaigns against Richmond. ABBOT (H. L.), 1868.

Smooth bore Cannon. Some observations on the theory of the deviation of spherical projectiles shot from. THEROUX (C. N.), 1859.

Steel gun factories in the United States. MACKINLAY, 1885.

ARTILLERY—*continued.*

Submarine Guns. BARBER (F. M.), 1874.

System of Ordnance calculated to prove the most efficient against iron-clad ships and batteries. BOXER, 1862.

Table showing the fall by gravity in the atmosphere. ANSTRUTHER, 1866.

Tension of Winding Wire Guns. ALGER (P. R.), 1880.

Text Book of Gunnery. MACKINLAY, 1887.

Theory of Gunnery. ANSTRUTHER (P.), 1871; PRINGLE (Sir J.), 1778.

35-ton gun Competition. Report of the Ordnance Council, 1870. PARLIAMENTARY..Papers, p. 493.

"Thunderer" (H.M.S.). Report on the bursting of one of the 38-ton guns in her turret. THUNDERER (H.M.S.), 1879. Why the "Thunderer's" gun burst. LONGRIDGE, 1879. Cause of the explosion. PALLISER, 1879.

Treatise on the manufacture of Guns. ANONYMOUS, 1886, p. 58.

Trial of a 32-pounder cast-iron gun converted into a 64-pounder Rifled gun of 60 cwt. PALLISER, 1866.

—— 12″ R.M.L. gun from H.M.S. "Thunderer." Report of Special Committee on Ordnance, 1880. PARLIAMENTARY..Papers, p. 493.

United States Artillery. Journal of the. PERIODICAL PUBLICATIONS, p. 18.

United States Ordnance. UNITED States, pp. 354, 355.

Volley Gun: a new system of Artillery. VANDENBURGH (O.), 1864.

Whitworth Gun. ANONYMOUS, 1864, p. 40.

—— Whitworth 9-inch Breech-loading Gun. Report of Experiments with. WHITWORTH (Sir J.), 1883.

See Armstrong (above).

Wire Guns. Memorandum on the cause of Rupture of Jacket 6″ B.L. Wire Gun. LONGRIDGE, 1888. Longridge on the use of wire in the manufacture of Guns. CALLENBERG, 1885.

Woolwich system of rifled Ordnance. ANONYMOUS (1878), p. 58.

ARTILLERY (ARMOUR PLATES). *See* ARMOUR-PLATES.

ARTILLERY (BALLISTICS). HARTMANN (J.), 1856; PITON-BRESSANT, 1892.

Calculation of Trajectories in direct and curved fire. GREENHILL (A. G.).

Electro-ballistic Machines. BENET, 1866.

Experiment for determining the relative strains of a gun. PALLISER, 1864.

ARTILLERY (BALLISTICS)—*continued.*

Exterior Ballistics. SIACCI (F.), 1892.

Force of fired gunpowder. HUTTON (C.), 1778.

Interior Ballistics with treatment of the more common high explosives. GLENNON (J. H.), 1894. Add 503.

Internal Ballistics, 1887, '89. LONGRIDGE.

Measurement of Powder Pressures in Cannon by means of the registered compression of oil. WOODBRIDGE (W. E.), 1878.

New method of analysing trajectories and application to the firing of rifled cannon. HUGON, 1859.

Velocity of Combustion of an Explosive under variable pressure. GLENNON (J. H.), 1893. Add 503.

ARTILLERY (GUN CARRIAGES).

Four experimental carriages of Major Campbell's pattern. CAMPBELL (F. H.), 1860.

India. Gun Carriage Factory, Allahabad. Accident to the Store-room, 1870. INDIA, p. 109.

Moncrieff System applied by hydro-pneumatic gun-carriages to harbour defences. MONCRIEFF (A.), 1884.

Muzzle Swivelling and Hydraulic Gun Mounting. MALLET (R.), 1860.

Wright's Artillery Railway and Gun Carriage. WRIGHT (Thomas), 1865.

ARTILLERY (PROJECTILES). SCOTT (M.), 1862, 1866, p. 177.

Elongated Projectiles. THIROUX (C. N.), 1857.

Motion of Projectiles fired from rifled arms. OWEN (C. H.), 1862.

Penetration of armour-plates with long shells of large capacity fired obliquely. WHITWORTH (Sir J.), 1869.

Professional Notes on Armour and Projectiles. MAGUIRE, 1884.

Projectiles. France. FRANCE, 1837, p. 435; GOSSELIN, 1831.

Rifle bullets, Experiments to determine the velocities. HAUGHTON (S.), 1862.

Shells and Shell Guns. DAHLGREN, 1857.

Shell Trials at Shoeburyness. ANONYMOUS, 1878, p. 55.

Shrapnell Shell in England and in Belgium. BORMANN, 1862.

ARTS (DECORATIVE). Principles which should determine form in Decorative Arts. WYATT (M. D.), 1852.

Ornamental Art as applicable to trade and manufactures. BALLANTINE (J.), 1847.

ARTS (FINE).

Fine Arts in England, obstructions to the acquisition of. BARRY (J.), 1775.

ARTS (FINE)—*continued.*

Great Britain. Art treasures, being an account of the chief collections of paintings, drawings, sculptures, etc.
WAAGEN (G. F.), 1854–'57.

Journal of Indian Art. PERIODICAL PUBLICATIONS, p. 18.

Lectures on Art. RUSKIN (J.), 1875

Pigments, Paint, and Painting: a practical book.
TERRY (G.), 1893.

Report of Fine Arts Commission, 1842.
PARLIAMENTARY.. Papers, p. 478.

Royal Academy Commission. Report of.
ROYAL Academy, 1863. Add 531.

Sydney. Mechanics' School of Art. Annual Report and Commemorative Address. SYDNEY, 1883, p. 274.

Vinci, Leonardo da, his Manuscripts. VINCI (L. da), 1881.

World's debt to Art. HOPE (A. J. B. B.), 1863.

ARTS (INDUSTRIAL), chefs-d'œuvre of. Pottery, porcelain, glass enamel, metal, Goldsmith's Art, jewelry and tapestry.
BURTY, 1869.

ARTS (LIBERAL) and Mechanical Arts. Plates.
ANONYMOUS, 1771–72, p. 54.

Mechanical Arts: Smithing, Joinery, Carpentry, Turning, and Bricklayery. MOXON, 1703.

ARTS (MANUAL). "Human Industry." ANONYMOUS, 1661, p. 47.

ARTS AND CRAFTS. Geometry and Mechanics.
LADERCHI, 1829

ARTS AND MANUFACTURES.

Jewel house of Art and Nature (inventions, husbandry, minerals).
PLAT, 1653.

Papers read before Society of Arts. AIKIN, 1841.

Paris. École Centrale des Arts. Programmes, 1838, 1867–69.
PARIS, p. 453.

—— Conservatoire des Arts et Métiers. Annales, 1860, etc. Catalogue of Collections, 1882; Prospectuses, etc., 1886–90, '92. PARIS, p. 453.

—— Société des anciens élèves des Écoles Nationales d'Arts et Métiers, Annuaire. PARIS, p. 459.

Repertory of Arts and Manufactures.
PERIODICAL PUBLICATIONS, p. 23.

Results of Parliamentary Inquiry. FOGGO, 1837.

See also INDUSTRY, MANUFACTURES, TRADE AND COMMERCE.

ARTS AND SCIENCES among the Ancients. DUVIVIER, 1830.

ASBESTOS AND ITS APPLICATIONS. BOYD (I.), 1886.
Bell's Asbestos. BELL (J.) & Son, 1886.
Canada. Asbestos Mines. JONES (R. H.), 1888.
Production and use. JONES (R. H.), 1888, '90.
Use as steam engine "packing." DAY (St. J. V.), 1872.

ASPHALT. DIETRICH, 1881–85. Asphalt and Bitumen. BECKWITH, 1868. Uses of Bitumen. COCHRANE, 1870. Mineral Bitumen. HUGUENET, 1852; DELANO, 1893. Varieties, Properties, and Uses. HALLECK (H. W.), 1841.
Application of Asphalt to Street paving. ELLICE-CLARK, 1879.
Asphalt paving and bituminous rock Companies. SHARWOOD (A.), 1871.
Asphaltic Masonry. MALO, 1885.
Asphaltic Mastic, application of, to flooring, roofing, and hydraulic works in India. GOODWYN, 1843.
Machine for distributing Sand, Gravel or Salt upon Asphalt. HORNSBY & Sons, 1880.
Origin, preparation and applications. MALO, 1863, '70, '88.
Present state of the industry. MALO, 1879.
Use of Natural Asphalt in Buildings. HENNING, 1866.

Germany. DÜCKER, 1881.
Seyssel Asphaltic mastic. COIGNET (P.), 1875; SIMMS (F. W.), 1837, 1838. Instructions for its use. SEYSSEL Asphalte Coy., 1844.
Seyssel and other Asphalt Companies in France. FOURNEL, 1838.
Trinidad. DUNDONALD, 1857.
Val de Travers, Neufchatel, Asphaltic Mine. FOURNEL, 1838.

ASSAYING. Accuracy of Assay for Silver. DEWEY (F. P.), 1894. Add. 496.
Assay Offices. Irregularities in London, Chester, Exeter and Newcastle-upon-Tyne, 1793. PARLIAMENTARY..Papers, p. 466.
Assayer's Guide. LIEBER, 1869
Docimastic Examination of Ores. KERL, 1883.
Gold, Silver, Copper and Lead Ores. BROWN (W. L.), 1890.
Iron and Steel assay and analysis of iron ores and fuel. BAYLEY, 1884.
Lead, Copper, silver, gold and mercury. BODEMANN and Kerl, 1868.
Manual. KERL, 1883; MITCHELL (John), 1854, '68.
Report on Assays made to test the quality and strength of the products of the works of MM. de Wendel et Cie. TETMAJER (L.), 1891.

"ASSISTANCE" (H.M.S.), Voyage. BELCHER, 1855.

ASSURANCE. *See* INSURANCE (Life).

ASTROLOGY. Grammar of Astrology. ZADKIEL, 1840.

ASTRONOMICAL DAY, proposed change in reckoning. CANADIAN Inst., 1893.

ASTRONOMY (GENERAL REFERENCES). AIRY (Sir G. B.), 1859, p. 16; ALPHONSO X.; ANONYMOUS, 1850, p. 40; BARROW (J), 1675; GUERICKE, 1677; LALANDE, 1781–92; LAPLACE, 1821. Ancient and Modern. BAILLY, 1805.

Animadversions on the first part of the Machina Cœlestis of Helvetius. HELVETIUS, 1674.

Architecture of the Heavens. NICHOL, 1851.

Astro-theology. MOSELEY, 1847

Astronomical and other Refractions. ATKINSON (H.), 1825

Astronomical Bulletin. RIO de Janeiro, 1881–3.

Astronomical Notices. SMYTH (C. P.), 1861–2.

Astronomy and general physics considered with reference to Natural theology. BRIDGEWATER Treatise, 3.

Celestial Atlas. JAMIESON (A.), 1827.

Celestial Worlds discovered. HUYGHENS, 1722.

Definitions of terms used in. HODGKIN, 1804.

Distances of the Moon, Planets, and the Sun. PINNINGTON, 1886.

Earth as a planet. THOMAS (W. J.), 1882.

—— Motions of the Earth and Heavenly bodies explained by electro-magnetic attraction. CUNNINGHAM (P.), 1834.

—— Theory of the System of the World. PONTECOULANT, 1829–34.

Ecliptic, on the position of the, as inferred from observations with the Cambridge transit and mural circle. AIRY (Sir G. B.), 1835, p. 21.

Elements. ACADÉMIE des Sciences (1740); ANONYMOUS, p. 56; BRINKLEY, 1819; COOKE (S.), 1875; FRANCŒUR, 1818; JEANS (Rev. G.), 1841; LA CAILLE, 1750; OLIVER (J. A. W.), 1888.

Examinations of various solutions of Kepler's problem. BRINKLEY, 1803.

Fixing positions by the more simple Astronomical Observations. GORDON (E. S.), 1881.

Government of the Heavens. PURSLO, 1852.

Handbook. LARDNER, 1875.

History from 1781–1802. LA LANDE (J. J. Le F. de), 1803. App. 565.

Institutions of Astronomical Calculations. MARTIN (B.), 1765. App. 567.

Lectures on Astronomy. AIRY, Sir G. B., 1849, p. 23; ARAGO, F., 1845; MOSELEY, 1850.

ASTRONOMY (GENERAL REFERENCES)—*continued.*

Manual. GALBRAITH and Haughton, 1857.
Mécanique céleste. BOUR, 1885; LA PLACE, 1821–27.
Mechanism of the Heavens. OLMSTED, 1850; SEELIGER, 1890.
Movement of the Solar System in Space. AIRY, Sir G. B., 1859, p. 21.
Nebular Hypothesis, Brief Examination of. WALLIS (J.), 1845.
New Views in Astronomy. HARRIS (John), 1879.
Outlines. HERSCHEL (Sir J. F. W.), 1871.
Prælectiones Astronomicæ. WHISTON (W.), 1707.
Problems and their solutions. JEANS (H. W.), 1849.
Recreations in Astronomy. TOMLINSON (Rev. L.), 1846.
Researches on the constitution of gaseous worlds. RITTER (A.), 1889.
Rotation of the Earth and Planetary Bodies. WALKER (William L.), 1877.
Simplicity of the Creation. ADOLPH, 1864.
Theory and practice. DELAMBRE, 1814; HYMERS, 1840.
Treatise. HERSCHEL (Sir J. F. W.), 1833, '40.
United States. Astronomical Work of 1889 and 1890. WOODWARD (R. S.), 1890.

ASTRONOMY (ASTRONOMICAL GEOLOGY). BROWNE (R. G. M.), 1865.
Astronomical Causes which may influence Geological Phænomena. HERSCHEL (Sir J. F. W.), 1832, p. 50.

ASTRONOMY (INSTRUMENTS).

Azimuthal Circle. Determination of the probable stability of an, by observations of Stars. AIRY (Sir G. B.), 1851, p. 19.
—— Azimuths without calculation. RUSSEL (R.), 1852.
Circles Astronomical. On the investigation of. BRÜHL (J. M. de), 1794. App. 550.
Globes and Orrery. Description and use, and account of the Solar System. HARRIS (J.), 1732. App. 560.
New Standard Scale of the Royal Astronomical Society. BAILY, 1836.
Revolutions of heavenly bodies by the mechanism of Wheels. JANVIER (A.), 1812. App. 563.
Sun-and-Planet instrument. ANONYMOUS, 1875, p. 56.
Telescopes. Inferiority of Reflecting Telescopes when compared with Refractors. HERSCHEL (Sir J. F. W.), 1825.
—— Solar Transit, Use of the. HAUPT (L. M.).
—— Transit Instrument. Description of a new. ENGLEFIELD (Sir H. E.), 1814. App. 556.
Transit Instrument. CLARK (L.), 1882, '84.
Zenith Sector. Observations with Ramsden's. COLBY and Yolland, 1842.

ASTRONOMY (MYTHOLOGICAL) of the Ancients. MACKEY, 1822.

ASTRONOMY (NAUTICAL). Treatise. BYRNE (O.), 1876; MARTIN (W. R.), 1888; RAPER, 1849, 1870. Instrumental Nautical Astronomy, Development of. WILSON-Barker (D.), 1891. Introduction to Spherics and Nautical Astronomy. KELLY (Dr. P.), 1822.

—— Connaissance des temps, 1759–1815. ACADÉMIE des Sciences. Additions, LAPLACE, 1813.

—— Nautical Almanac and Astronomical Ephemeris. PERIODICAL PUBLICATIONS, p. 20.

See also NAVIGATION,

ASTRONOMY (OBSERVATIONS).

Astronomical Observations made in the Southern Hemisphere. WALES (W.), 1788.

Transit Observations. Probable errors of the eye and ear in them. ROBINSON (T. R.), 1853.

Armagh Observatory. Places of 5,345 stars observed there, from 1828–1854. ROBINSON (T. R.), 1859.

Cambridge Observatory. Astronomical Observations. AIRY (Sir G. B.); CAMBRIDGE Observatory, 1829–79.

——, St. John's College. Astronomical Observations made in, in 1767 and 1768, and account of several Astronomical Instruments. LUDLAM (W.), 1769. App. 566.

Cape Observatory. Observations, 1834–38, 1856–57, 1876. CAPE Town.

—— Catalogue of Stars, 1834–40, 1836–61. CAPE Town.

Copenhagen Observatory. Observations, 1781–83. BUGGE, 1784.

Dublin Observatory. Observations made at the Observatory of Trinity College, Dublin. BRINKLEY, 1815.

Dublin. Analytical investigations respecting Astronomical Refractions. BRINKLEY, 1815.

Dudley Observatory. Annals. DUDLEY Observatory, 1866–71. Add 497.

—— Defence of Dr. Gould. Reply to Statement of Trustees. GOULD (B. A.), 1858, '59.

Edinburgh Observatory. Observations. EDINBURGH.

Greenwich Observatory. Observations. BESSEL, 1818.

—— Greenwich Observations, 1765–1798, 1831–35, 1838–40, &c. GREENWICH Observatory.

—— Results of Observations, 1847–58. GREENWICH Observatory.

—— Reports of the Astronomer Royal to the Board of Visitors, 1836, &c. GREENWICH Observatory.

—— Probable effects of a railway passing near. GREENWICH Observatory, 1846, 1865.

ASTRONOMY (GEN
Manual.
Mécanique céleste.
Mechanism of the H
Movement of the Sc
Nebular Hypothesis,
New Views in Astron
Outlines.
Prælectiones Astronom
Problems and their solu
Recreations in Astronon
Researches on the consti
Rotation of the Earth and
Simplicity of the Creation.
Theory and practice.
Treatise.
United States. Astronomica

ASTRONOMY (ASTRONOMICAL GE
Astronomical Causes which may
HERS

ASTRONOMY (INSTRUMENTS).
Azimuthal Circle. Determination
by observations of Stars.
—— Azimuths without calculation.
Circles Astronomical. On the inves
BRÜHL
Globes and Orrery. Description a
Solar System. HA
New Standard Scale of the Royal Astr
Revolutions of heavenly bodies by the m
JANVIE
Sun-and-Planet instrument.
Telescopes. Inferiority of Reflecting Tel
with Refractors. HERSCHE
—— Solar Transit, Use of the.
—— Transit Instrument. Description of a
ENGLEFIELD (Sir H. 1
Transit Instrument. C.
Zenith Sector. Observations with Ramsden's.
COLBY

ASTRONOMY (SPECIAL)—*continued.*

Auroræ, their character and spectra. CAPRON (J. R.), 1879.

Comets. Biela's Comet. HERSCHEL (Sir J. F. W.), 1832.

—— **Comet of 1264 and 1556**; expected return.
HIND (J. R.), 1848.

—— **Comet of 1844–45.** POLE, 1845.

—— **Determination of the Orbits of Comets.**
AIRY (Sir G. B.), 1839, p. 19; LEGENDRE, 1805 6.

— **Distance of a Comet from the Earth.**
LUBBOCK (Sir J. W.), 1835.

– **Encke's Comet.** ENCKE, 1832.

Halley's Comet. HERSCHEL (Sir J. F. W.), 1837.

—— Reduction of the observations made in 1835 and 1836.
AIRY (Sir G. B.), 1847, p. 22.

ley's investigation of the orbits of Comets.
RIGAUD (S. P.), 1835; RIGAUD, 1835. App. 574.

eneral properties of, and particularly the Eclipse of
SMITH (George), 1748. App. 577.

f Agathocles. AIRY (Sir G. B.), 1857, p. 20.

AIRY (Sir G. B.), 1857, p. 20.

d. AIRY (Sir G. B.), 1857, p. 20.

AIRY (Sir G. B.), 1857, p. 20. Ottmann's cal-
AIRY (Sir G. B.), 1858, p. 18. Result of
ations. AIRY (Sir G. B.), 1853, p. 21

a and the Hindu method of calculating
SPOTTISWOODE (W.), 1863.

of Bouvard's elements of the Orbits of
GREENWICH Observatory, 18[illegible].

f an Observatory to the observation of
s. AIRY (Sir G. B.), 1872, p. 22.

titude of the polar star.
SALMON (W.), 18[illegible].

servations made to find the [illegible]
TAYLOR (J. L.), 18[illegible].

ASTRONOMY (OBSERVATIONS)—*continued.*

Greenwich Observatory. Description of the great Equatorial. GREENWICH Observatory, 1869.

Heligoland. Observations. SCHUMACHER (H. C.), 1825

Hong Kong Observatory. Observations, 1884, &c. HONG KONG.

Lisbon. Annaes do Observatorio do Infante Dom Luiz, 1882, &c. LISBON.

London. Astronomical Observations taken during 1839–1851. BISHOP (G.). App. 548.

Madras Observatory. Astronomical Observations. TAYLOR (T. G.), 1835.

New South Wales. Astronomical workers in. RUSSELL (H. C.), 1888.

Sydney Observatory. Results of Astronomical Observations made in 1879, '80, '81. SYDNEY, p. 274.

Teneriffe. Astronomical Experiment of 1856. SMYTH (C. P.), 1858.

United States. Astronomical and Meteorological Observations made from the years 1851. UNITED States, 1862–77, p. 352.

—— Naval Astronomical Expedition to the Southern hemisphere during the years 1849–52. UNITED States, 1856, p. 341.

ASTRONOMY (PHYSICAL). HERSCHEL (Sir J. F. W.), 1849. History. GRANT (R.), 1852.

Explication of several important points in Physical Astronomy. STEWART (M.), 1761 ; STEWART (M.), 1761. App. 577.

Integration of certain Differential Expressions with which problems are connected. WOODHOUSE (R.), 1804.

Report on Observations in Astronomical Physics, 1877. PARLIAMENTARY.. Papers, p. 515.

ASTRONOMY (PRACTICAL). Treatise. VINCE (Rev. S.), 1790. App. 579.

Astronomical tables. LOOMIS, 1868.

In France and England. GAUTIER, 1825.

ASTRONOMY (THEORETICAL). Relating to the Heavenly Bodies revolving round the Sun in accordance with the Law of Gravitation. WATSON (J. C.), 1869.

ASTRONOMY (SPECIAL).

Aerolites, Parallax and movement of. PETIT, 1846.

Aurora Borealis. Instructions for Observers. British Association, 1835.

—— Physical and historical. ACADÉMIE des Sciences, 1754.

—— Seen at York, 24 Oct., 1847. PHILLIPS (J.).

ASTRONOMY (SPECIAL)—*continued.*

Auroræ, their character and spectra. CAPRON (J. R.), 1879.

Comets. Biela's Comet. HERSCHEL (Sir J. F. W.), 1832.

—— Comet of 1264 and 1556; expected return. HIND (J. R.), 1848.

—— Comet of 1844–45. POLE, 1845.

—— Determination of the Orbits of Comets. AIRY (Sir G. B.), 1839, p. 19; LEGENDRE, 1805–6.

—— Distance of a Comet from the Earth. LUBBOCK (Sir J. W.), 1835.

—— Encke's Comet. ENCKE, 1832.

—— Halley's Comet. HERSCHEL (Sir J. F. W.), 1837.

—— —— Reduction of the observations made in 1835 and 1836. AIRY (Sir G. B.), 1847, p. 22.

—— Halley's investigation of the orbits of Comets. RIGAUD (S. P.), 1835; RIGAUD, 1835. App. 574.

Eclipses. General properties of, and particularly the Eclipse of 1748. SMITH (George), 1748. App. 577.

—— Eclipse of Agathocles. AIRY (Sir G. B.), 1857, p. 20.

—— at Larissa. AIRY (Sir G. B.), 1857, p. 20.

—— at Stiklastad. AIRY (Sir G. B.), 1857, p. 20.

—— of Thales. AIRY (Sir G. B.), 1857, p. 20. Ottmann's calculation. AIRY (Sir G. B.), 1858, p. 18. Result of recent calculations. AIRY (Sir G. B.), 1853, p. 21.

—— Suria Siddhánta and the Hindu method of calculating them. SPOTTISWOODE (W.), 1863.

Jupiter. Corrections of Bouvard's elements of the Orbits of Jupiter and Saturn. GREENWICH Observatory, 1869.

—— Proposed devotion of an Observatory to the observation of Jupiter's satellites. AIRY (Sir G. B.), 1872, p. 22.

Latitude found from the altitude of the polar star. SALMON (W.), 1850.

Longitude. Astronomical Observations made to find the longitude of Madeira. TIARKS (J. L.), 1822.

Mars in right ascension at the opposition of 1860. AIRY (Sir G. B)., 1858, p. 17.

Meridian. Cape Observatory Verification and extension of La Caille's Arc of Meridian. CAPE Town.

—— How to establish a true Meridian. HAUPT (L. M.), 1891.

—— Observations in 1825 for determining the difference of the Meridians of Greenwich and Paris. HERSCHEL (Sir J. F. W.), 1826.

Meteors. Falling Stars and Meteors in general. FORSTER, 1846.

—— Meteor seen 19 Dec., 1849. FORBES (J. D.).

—— Meteors in India. BUIST, 1850.

ASTRONOMY (SPECIAL)—*continued.*

Meteors. Phenomena of Meteors. LOSEBY, 1867.
—— Meteorite No. 2 from Gilgoin Station. RUSSELL (H. C.), 1893.
—— Iron Meteorite found at St. Julião de Moreira. BEUSANDE (A.), 1888.
—— Shooting Stars. LUBBOCK (Sir J. W.), 1848–49.
Moon. Airless and Waterless condition of the. GRENSTED, 1888.
—— Apparent acceleration of the Moon's mean motion in Longitude. AIRY (Sir G. B.), 1866, 1880, p. 22.
—— Conjectures on the physical condition of the surface of the moon. BABBAGE (C.), 1847.
—— Coronæ around the Moon. JORDAN (C. W.), 1799.
—— Eclipse of the Moon observed at Graham's in Fleet Street. BEVIS (J.), and Short, 1749. App. 548.
—— —— May 8, 1762, Account of. SHORT (J.). App. 576.
—— Elements of the Moon's Orbit. AIRY (Sir G. B.), 1859, p. 16.
—— Lunar Inequalities. LA PLACE, 1820.
—— Lunar Surface and its temperature. ERICSSON, 1886.
—— Lunar Tables. LA PLACE, 1820.
—— Lunar Theory. AIRY (Sir G. B.), 1831, p. 17.
—— Lunar Theory, new method. AIRY (Sir G. B.), 1874, p. 18.
—— Method determining the mass of the Moon from transit of Venus observations. AIRY (Sir G. B.), 1829, p. 18.
—— Method of clearing the Lunar Distance. AIRY (Sir G. B.), 1881, p. 18.
—— Moon turning on its own axis. Answer to Ferguson's essay on. FERGUSON (J.), 1748. App. 557.
—— Motions. MAYER, 1770.
—— Phenomena of the Harvest Moon and description of a new four-wheeled Orrery. FERGUSON (J.), 1747, '48. App. 556 and 557.
—— Reduction of Observations of the Moon from 1750 to 1830, 1831 to 1851. GREENWICH Observatory.
—— Tables. HANSEN (P. A.), 1857.
—— Tables for correcting Lunar Distances. CURTIS (J. G. C.), 1836. Corrections to Hansen's Tables of the Moon. NEWCOMB, 1876.
—— Theory of the Moon and the perturbations of the planets, 1834–50. LUBBOCK (Sir J. W.). New Improvement of the theory of. BROWNE (Robert), 1731. App. 550.
—— Time and Tide, a Romance of the Moon. BALL (Sir R. S.), 1889.
—— Transits of the Moon and fixed stars. AIRY (Sir G. B.), 1850, p. 22.

ASTRONOMY (SPECIAL)—*continued.*

Neptune, Lectures on the new planet. Neptune and its discovery. JERWOOD (J.), 1849. App. 563.

—— "Neptune and the Royal Astronomical Society's Medal." Reply to Mr. Babbage's letter to the *Times* on. SHEEPSHANKS (Rev. R.), 1847. App. 576.

—— Story of the new planet Neptune. ANONYMOUS, 1847. App. 545.

Occultations and Eclipses observed at Dorchester, Mass. BOND (W. C.), 1829. App. 549.

—— Apparent projection of stars upon the Moon's disk in. AIRY (Sir G. B.), 1859, p. 19.

Orion. Variability and periodical nature of the Star α Orionis. HERSCHEL (Sir J. F. W.), 1841.

Planets. Calculation of the perturbations of the small planets and the Comets of short period. AIRY (Sir G. B.), 1834, p. 19.

—— Experiments on the light given by Venus, Mars, Jupiter, and Saturn, as compared with that of the fixed stars, and on the relative whiteness of their surfaces. SEIDEL (P. L.), 1859.

—— Formation of greater Planets. CADET, 1860.

—— Method of computing the Perturbations of Planets. ENCKE, 1852.

—— The Planets upon Cardioides. CARRUTHERS, 1888.

—— Planetary Theory. AIRY (Sir G. B.), 1831, p. 17.

—— Reductions of Planetary Observations, 1750 to 1830, 1831, 1835. GREENWICH Observatory, 1845, 1864.

Stars. Apparent motion observed in some of the fixed stars. BRADLEY (Dr. J.), 1747.

—— Approximate places of 321 new double and triple stars. HERSCHEL (Sir J. F. W.), 1825.

—— Catalogue of Stars from Flamsteed's Observations. HERSCHEL (Carolina), 1798.

—— Catalogue of stars observed at United States Naval Observatory during years 1845–1877. YARNALL (M.), 1889.

—— Catalogue of known variable Stars. GORE (J. E.), 1884.

—— Catalogue of 6,415 Stars for the epoch, 1870. Glasgow Observatory. GRANT (R.), 1893.

—— Catalogues of Stars, 1836, '43, '49, '56. GREENWICH Observatory.

—— Determination of the motion of the Solar system in fixed unalterable space. GARDINER (M.), 1883.

—— Formulas for Binary Stars. GORE (J. E.), 1886.

—— List of test objects, principally double Stars, for the trial of telescopes. HERSCHEL (Sir J. F. W.), 1834.

ASTRONOMY (SPECIAL)—*continued.*

Stars. Micrometrical Measures of Double Stars.
HERSCHEL (Sir J. F. W.), 1831, '34.

—— Movement of the Stars. PIMENTEL, 1874.

—— New Star in Auriga. HUGGINS (W.), 1892.

—— New Tables for facilitating the computation of precession, aberration and nutation of 2881 principal fixed stars.
BAILY, 1827.

—— Notice of the Elliptic Orbits of ξ Bootis and η Coronæ.
HERSCHEL (Sir J. F. W.), 1833.

—— Observations made with a twenty-feet reflecting Telescope. 1st–6th Catalogues of double and triple stars.
HERSCHEL (Sir J. F. W.), 1826–32.

—— Observations of Nebulæ and Clusters of Stars.
HERSCHEL (Sir J. F. W.), 1833.

—— Occultations of the Fixed Stars.
HERSCHEL (Sir J. F. W.), 1824.

—— Orbits of revolving double Stars.
HERSCHEL (Sir J. F. W.), 1832.

—— Parallax of the fixed stars.
HERSCHEL (Sir J. F. W.), 1826, '27.

—— Physical connection between Stars forming binary or multiple groups. FORBES (J. D.), 1849–50.

—— Places of 5,345 stars observed from 1828 to 1854 at the Armagh Observatory. ROBINSON (T. R.), 1859.

—— Planetary and Stellar Worlds. MITCHELL (O. M.), 1850.

—— Planetary and Stellar Universe. MANN (R. J.), 1845.

—— Plurality of Worlds. ANONYMOUS, 1853, p. 50.

—— Probable Orbit of a Binary Star.
HERSCHEL (Sir J. F. W.), 1849.

—— Red Stars. Cunningham Memoirs, vol. 5.
ROYAL Irish Academy, 1880–88.

—— Revision and re-arrangement of the Constellations.
HERSCHEL (Sir J. F. W.), 1841.

—— Revision of the Nomenclature of Stars.
BRITISH Association, 1848.

—— Sidereal Chromatics. The colours of multiple Stars.
SMYTH (Admiral W. H.), 1864.

—— Star Atlas and tables to facilitate the determining of the true meridian. DONKIN (J. B.), 1872.

—— Stars of the constellations of Bode visible in the latitude of Greenwich. BRITISH Association.

—— Stars Double and Triple. Catalogue of 838.
SOUTH (Sir J.), 1826.

—— Stellar Astronomical Studies. The Milky Way and the distance of fixed Stars. STRUVE (F. G. W.), 1847.

ASTRONOMY (SPECIAL)—*continued.*

Stars. Stellar Universe. THOMAS (W. J.), 1882.

Sun. Arrangement for observing the passage of the Sun's Image across the wires of a Telescope. SANG (E.), 1887.

—— Contributions to Solar Physics. LOCKYER, 1874.

—— Coronæ around the sun. JORDAN (C. W.), 1799.

—— Correction of Solar Tables required by Mr. South's observations. AIRY (Sir G. B.), 1827, p. 22.

—— Description of a new Astronomical Rotula for showing Rising and Setting of the Sun. MARGETTS (G.), 1790. App. 567.

—— Discordances between the Sun's observed computed ascensions, 1821, 1822. SOUTH (Sir J.), 1826.

—— Distance. Means available in the next 25 years for correcting the measure. AIRY (Sir G. B.), 1857, p. 20.

—— Eclipse (annular) of the sun, Sept. 7, 1820. BAILY, 1818.

—— Eclipse of 1842. AIRY (Sir G. B.), 1842, p. 18.

—— Total eclipse of the sun, 1851. AIRY (Sir G. B.), 1851, p. 22. Suggestions to Astronomers. BRITISH Association, 1858.

—— Annular Eclipse of the Sun. AIRY (Sir G. B.), 1858, p. 16.

—— Total eclipse of the sun, 18 July, 1860, AIRY (Sir G. B.), p. 15; observed at Dongalah (Nubia). MAHMOUD Bey.

—— Expedition to Spain for observing total eclipse of the Sun, July 16, 1860. POLE, 1860.

—— Eclipse, 1860. AIRY (Sir G. B.), 1861, pp. 17, 20.

—— Observations to accompany the Map of the Shadow-path. VIGNOLES (C. B.), 1860.

—— Eclipse, 1868. DE LA RUE.

—— Solar Eclipse at Colombo. Observations. GRINLINTON, 1868.

—— Eclipse, Dec. 1870. Path of the total phase. HIND (J. R.).

—— Eclipse, 9 Sept., 1885, New Zealand. NEW ZEALAND, p. 413.

—— Fuel of the Sun. WILLIAMS (W. M.), 1870.

—— —— Solar heat, substitute for fuel in tropical countries. ADAMS (W.), 1878.

—— Light, sun spots, &c. LOPES, 1886.

—— Magnetic influence in the Solar rays. CHRISTIE (S. H.), 1826.

—— Means of determining the temperature of parts of the Sun. HIRN (G. A.), 1885.

—— Motions. MAYER, 1770.

—— New process of measuring the height of the Sun. MIDDLETON (E. E.), 1874.

—— Preservation of Solar Energy. HIRN (G. A.), 1883.

—— Reports of Committee on Solar Physics, 1879, '82. PARLIAMENTARY..Papers, p. 515.

ASTRONOMY (SPECIAL)—*continued.*

Sun. Solar Investigations. ERICSSON, 1876.

—— Solar Observations. Results, Stonyhurst College. STONYHURST Coll., 1866, etc.

—— Spectrum. Wave-lengths corresponding to Kischhoff's lines in the Solar Spectrum. AIRY (Sir G. B.), 1867, p. 22.

—— Sun's distances and the Transits of Venus. ELLERY, 1882.

—— Table for determining apparent Time from observed altitudes of the Sun or a Star. ANONYMOUS, 1818, p. 56.

—— Table of the Bearings of the Sun between the parallels of 14° and 20° South. ANONYMOUS, 1858, p. 56.

Tables Astronomiques, 1735. ACADÉMIE des Sciences.

Tables of the Sun, Moon, Planets, fixed stars and satellites of Jupiter and Saturn, 1740. ACADÉMIE des Sciences.

Uranus, irregularities in motion. ADAMS, J. C., 1846.

—— Satellites of Uranus. HERSCHEL (Sir J. F. W.), 1834.

Venus, effect of, on the Moon. AIRY (Sir G. B.), 1847, p. 16.

—— Observations of Venus, with a view to determine the moon's mass by Airy's method. SANTINI (G.) &c., 1830.

—— Transit of Venus. ACADÉMIE des Sciences, 1877–78.

—— Transit of Venus and the Sun-distance. SMYTH (C. P.), 1883.

—— Method of observing and recording Transits. AIRY (Sir G. B.), 1849, p. 21.

—— Method of determining the mass of the Moon from Observations. AIRY (Sir G. B.), 1829, p. 18.

—— Voyage in California to observe Venus on the disk of the Sun, June 3, 1769. CHAPPE D'Auteroche (J.), 1772. App. 551.

—— Observations of the Transit of Venus, Dec. 9, 1874. AIRY (Sir G. B.), 1881, p. 15. NEW SOUTH WALES, p. 400. Method to be used in reducing observations. AIRY (Sir G. B.), 1875, p. 21. Preparations for the Observation. AIRY (Sir G. B.), 1874, p. 22. Value of the mean solar parallax and other elements deducible from telescopic observations. AIRY (Sir G. B.), 1877, p. 20.

—— Transit of Venus as seen at Lahore and Roorkee. Report on the preparations for and observations of. TENNANT (J. F.), 1877.

—— Transits of Venus, 1874 and 1882, arrangements for observation. AIRY (Sir G. B.), 1880, p. 23.

—— Transit of Venus, 1882. AIRY, Sir G. B., 1864, p. 22, 1880, p. 21. Report of Canadian Observations. CANADA, p. 216. Instructions for the Brazilian Commission. CRULS, 1882.

ATLANTIC AND PACIFIC, JUNCTION OF.

American Inter-Oceanic Ship Transfer. Present Aspect of the problem of. MOORE (Robert), 1888.

Atlantic and Gulf Ship Canal across the Peninsula of Florida. ATLANTIC and Gulf Ship Canal, 1877.

Atlantic and Pacific Junction Railway, from Halifax to mouth of Frazer's River in New Caledonia. SMYTH (Major R. C.), 1849.

Atlantic and Pacific Ship Canals and railroads. ATLANTIC and Pacific Ship Canal, 1867.

Atlantic and Pacific Ship-railway Company. ATLANTIC and Pacific Ship-Railway Company, 1888.

—— Atlanto-Pacific Ship Canal. Convention between Great Britain and the United States. ATLANTO-PACIFIC Canal, 1850. Add. 482.

—— Atlanto-Pacific Canal for all nations. Humboldt Line, *viâ* the Atrato-Cupicá valleys. ATLANTO-PACIFIC Canal, 1853.

Atlantic and Pacific Steam Navigation Company. 1859.

Central America and the transit between the oceans. SAMPSON (M. B.), 1850.

Communication between Atlantic and Pacific Oceans. BUCKLER, 1886.

International Railway. PIM (B.), 1866.

Inter-oceanic Canal Congress held at Paris, May 1874. Instructions to Admiral Ammen and A. G. Menocal and reports. INTER-OCEANIC Canal, 1879. Add. 511.

Inter-oceanic Canal Congress, Paris, 1879. INTER-OCEANIC Canal Cong.

Inter-oceanic Canal. Essay on the question of location for a ship canal across the American continent. STACKLE (H.), 1870. Project. MENOCAL, 1879. Report. SAN FRANCISCO, 1880. Reply to Lesseps. EADS, 1880.

Inter-oceanic problem and its scientific solution. CORTHELL, 1885.

Inter-oceanic Ship Canals. ADAMS (J. W.), 1870.

Isthmus. American Ship Canal. REED (Sir E. J.), 1881.

—— American Isthmian Transit. AMMEN (D.), 1887.

—— Bulletin du Canal interocéanique. PERIODICAL Publications, p. 12.

—— Communications between the Atlantic and Pacific. ATLANTIC and Pacific Railway, 1850.

—— Cutting of the great ship canal through Central America. BYAM, 1850.

—— Errors and fallacies of the Inter-oceanic Transit question. AMMEN (D.), 1886.

—— Inter-oceanic Canal Projects. ADAMS (J. W.), 1880.

—— Isthmus of Central America. FITZROY, 1851.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Plans for connecting by a navigable canal. GLYNN, 1849.

Practicability and Importance of a Ship Canal to connect the Atlantic and Pacific Oceans.
ATLANTIC and Pacific Ship Canal, 1855.

Practicability of a Ship Canal without locks by the valley of the Atrato. KELLEY (F. M.), 1856, '57; PITMAN (R. B.), 1825.

Proposed American Inter-Oceanic Canal in its Commercial Aspects. NIMMO (J.), 1880. Add. 523.

Proposed Inter-oceanic Ship Canal across the American Isthmus.
AMMEN (D.), 1878.

Proposed lines for Inter-oceanic Canals and Railroads.
DAVIS (C. H.), 1866.

Reports on the Studies of the International Commission of Exploration of the American Isthmus.
WYSE (L. N. B.), Reclus and Sosa, 1879.

Surveys for a Ship Canal across the American Isthmus.
AMMEN (D.), 1876.

United States Ship Canal Company. Destruction of Greytown by the United States Corvette "Cyane," July 13, 1854.
CARMICHAEL (J.), 1856.

Darien Canal.

A Darien *v.* the Suez Canal. DARIEN Canal, 1876.

Darien Inter-oceanic Canal. DARIEN Canal, 1876.

Expedition against the Isthmus of Darien under the Command of Sir G. M. McGregor. WEATHERHEAD (W. D.), 1821.

Explorations and Surveys. DARIEN Canal, 1874.

Gulf of Darien and Pacific Ocean Ship Canal and Steam Navigation Company. Prospectus, 1845. GULF of Darien.

Isthmus of Darien in 1852. GISBORNE.

Isthmus of Darien Ship Canal. History, letters and reports.
CULLEN, 1853, '56, '57.

Memorial to William III. on Darien and the rise and decline of Commerce. PATERSON (W.), 1852.

Report on the studies of the International Commission for the exploration of the Darien Isthmus. WYSE (L. N. B.), 1877.

Societies founded in Paris for its colonisation and canalisation.
SAMPER (J.), 1862.

Survey for an Inter-oceanic Ship Canal. DARIEN Canal, 1861.

Eads Railway. See *Tehuantepec.*

Honduras Railway.

Honduras Inter-oceanic Railway. BROOKS (W. A.), 1874; HONDURAS, 1872. Reports, etc. SQUIER (E. G.), 1854–57.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Nicaragua Canal.

At the Paris Exhibition of 1889. NICARAGUA.
Atlantic and Pacific Railway through Nicaragua. ATLANTIC and Pacific Railway, 1866.
Bird's-eye View of the Interoceanic Canal of Nicaragua and Costa Rica. LEUTHNER.
Contract, 1863. NICARAGUA.
Convention, 1850. Proposed Convention, 1859. Convention, 1869. NICARAGUA.
Description of Route, estimated cost and business, 1886. NICARAGUA.
Distance saved by the Nicaragua and Costa Rica Canal. NICARAGUA.
Maritime Gateway to the Pacific. THWAITE, 1893.
Mosquito, Nicaragua and Costa Rica. MOSQUITO, 1849.
Nicaragua and the Filibusters, 1856. NICARAGUA.
Nicaragua Canal. AMMEN (D.), 1886; BOUNICEAU, 1879.
Nicaragua Canal, 1846. NICARAGUA.
Nicaragua proposed interoceanic canal and projected routes. SQUIER (E. G.), 1851, 1852.
Nicaragua Railway, 1866. NICARAGUA.
Nicaraguan Railway Route. MAURY, 1866.
Piercing of the isthmus by the Nicaragua Canal. BELLY, 1858.
Plans, etc. THOMÉ de Gamond (A.), 1858.
Possible effects of earthquake shocks on the structure of the Canal. DUTTON (C. E.), 1891.
Profile, 1888. NICARAGUA.
Railway Concession to Capt. Bedford Pim, 1865. NICARAGUA.
Report and estimate of cost. COLLINSON (J.), 1866.
Report of British Engineers, 1852. NICARAGUA.
Report of Engineers of Canal Construction Co., 1889. NICARAGUA Canal; NICARAGUA Canal, 1893. Add. 523; MENOCAL (A. G.), 1893. Add. 520.
Report of Executive Committee, 1880. NICARAGUA.
Report of the U.S. Nicaragua Surveying Party, 1885. MENOCAL, 1886.
Sanitary notes on. BRANSFORD, 1883.
Ship Canals through Nicaragua. ATLANTIC and Pacific Steam Navigation Company, 1859.
Survey and estimates of cost. Map and profile of route. CHILDS (O. W.), 1852.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Panama Canal.

Canal of junction. BOUNICEAU, 1879; GARELLA, 1845

Compagnie universelle du Canal interocéanique de Panama, Projet de loi, 1886. PANAMA. Correspondence. LESSEPS (F. de & C. A. de), 1888. PANAMA, 1882.

Facilities for a Ship Canal through the Isthmus of Panama. LLOYD (J. A.), 1850.

Inspection, 1886. BIGELOW (Hon. J.).

Instructions to captains and pursers of Central American Steamers, 1862. PANAMA Railroad.

Intercourse between Great Britain and the Western Coast of South America *viâ* Panama. LIMA, 1836.

Isthmus of Panama. CHAMBERS (W. & R.); CHEVALIER, 1884; GRISWOLD, 1852; PANAMA, 1850. History. SEEMANN (B.), 1867.

Isthmus of Panama, Panama Railroad and Pacific Mail Steamship Co. OTIS, 1867.

Lesseps and his Canal. AMMEN (D.), 1880.

New Granada and the United States Diplomatic Controversy. PANAMA, 1857.

Panama and San Blas routes. A comparative view. SHELBOURNE (S. F.), 1880. San Blas Route. Inter-oceanic Ship Canal. SHELBOURNE (S. F.), 1880.

Panama Canal. DIRKS, 1880; DUMAS (A.), 1891; HERSENT, 1882; HILL (H. R.), 1845; KOEP, 1886. Historical, technical, and financial. PAPONOT, 1888, '89, '90. History, etc. RODRIGUES (J. C.), 1885. WYSE (L. N. B.), 1886; ZÖLLER (H.), 1882. Letters of an Engineer. PANAMA, 1887.

Panama Railroad Company. Report, &c., 1855. PANAMA Railroad.

Panama Ship Canal and Inter-oceanic Ship Railway Project. GOODWIN (J. M.), 1880.

Past, present, and future. BUNAU-Varilla, 1892.

Progress of Work on the Panama Canal during 1885. KIMBALL.

United States and the Panama Canal. GUSTAFSON, 1882.

Wheel carriage road across. ALLSOPP, 1834.

Working of the Panama Canal. COSSOUX, 1888.

Tehuantepec Railway.

Advantages it possesses over all other routes across the American isthmus, with reports of engineers. STEVENS (S.), 1871, 1872.

Eads Ship Railway. EADS, 1881.

Isthmus of Tehuantepec in the Republic of Mexico. DALE (R.), 1851; O'GORMAN, 1846. Survey, etc. BARNARD (J. G.), 1852; MORO, 1844, '45, '49.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*
Isthmian Ship Railway. CORTHELL, 1886.
Proposed Tehuantepec Ship Railway. PHELPS (S. L.), 1881.
Report on, and its practicabilities and commercial features.
TEHUANTEPEC Ship Rly., 1883, '84.
Report on the subject of a ship canal across.
WILLIAMS (J. J.), 1870.
Reports on explorations, etc., to ascertain its practicability.
SHUFELDT (R. W.), 1872.
Ship Railway across the isthmus of Tehuantepec.
EADS, 1882, 1886.
Tehuantepec Railway, its location, features and advantages.
STEVENS (S.), 1869, 1873; WILLIAMS (J. J.), 1870.
Tehuantepec Ship Railway. CORTHELL, 1884.
Transunion and Tehuantepec Route between Europe and Asia.
BURWELL (W. M.), 1851.

ATLAS. *See* MAPS.

ATOMS. Motion of Atoms. SMYTHIES (J. K.), 1885.

ATTRACTION. Attraction Theory. SMYTHIES (J. K.), 1850.
Certain limitations of the law of Newtonian attraction.
COLLIGNON, 1886.

ATTRITION, Resistance to. MAGANZINI, 1878.

AUTOMATA.
Automata: Old and new. COOKE (C. W.), 1893.
Automaton Chess player (Kempelen's).
ANONYMOUS, 1772. App. 544; BOOTH (J.), 1821. App. 549; WINDISCH (C. G. von), 1783. App. 581.
Automaton Chess-player redivivus.
ANONYMOUS, 1830. App. 544.

B.

"BACCHANTE" (H.M.S.) Cruise. ALBERT Victor, 1886.

BACTERIA. MAGNIN and Sternberg, 1884.
Germ Theory. SANDERS (L.), 1889.
See also DISINFECTION.

BALANCE.
Balance Beam. AGUDIO, 1887.
Torsion Balance. ZIMMERMANN (W. F.) 1885.

BALLISTICS. *See* ARTILLERY (Ballistics).

BALLOONS AND BALLOONING. Account of the first Aerial Voyage in England, 1784. LUNARDI.
Aeronautical expedition from London to Weilburg. MASON (Monck), 1836, '37.
Aeronautical Society of Great Britain. AERONAUTICAL Society; BREAREY, 1866.
Air-balloons and fire-balloons. CASSÉ, 1883.
Balloons and celebrated aeronauts, 1783–1890, History. TISSANDIER (G.)
Captive Balloons. Application of steam. MORRAUD, 1863.
Copper Air-balloon. MAREY-MONGE, 1845.
Dirigible. GRAFFIGNY, 1888.
First German Balloon in Berlin. KÖNIG.
Five Balloon Ascents in 1863. GLAISHER.
Giant Balloon; account of its construction, notices on the screw applied to aerial navigation. SILAS (F.), 1863.
History and principles. MAY (G.), 1885.
History and practice of Aerostation. CAVALLO, 1785.
Navigable Balloons. TISSANDIER (G.), 1872.
Photography from Balloons. TISSANDIER (G.), 1886.
Possibilities of Ballooning. BURNABY, 1884.
Proposition for a balloon railway across the Sahara Desert. BROWNE (J.), 1850.
Travels in the Air. GLAISHER, 1871.
Use in War. ESPITALLIER, 1888.
Winged (The) Aerostat. ARMOUR (1885).
See also AERIAL NAVIGATION.

BANKS AND BANKING. Bank Charter Act, Monetary Panics and their remedy. GASSIOT, 1867.

Bank Note and Banking Reform. GREIG, 1880.

Banking and the application of recent inventions to its purposes. SHARP (Granville), 1852.

Clearing-house, statistics of, BABBAGE (C.), 1856, p. 78.

Facts and reasons in favour of Joint Stock Banks. FARREN, 1833.

Ireland. Joint Stock Banking in, Inquiry into the state of, particularly as regards the effects of the Bank of Ireland monopoly. LOYAL National Repeal Assoc., 1884. Add. 516.

Joint Stock Banks. Reports, 1836–38. PARLIAMENTARY..Papers, p. 466.

Law of Bankers' Cheques, letters of credit and drafts. SHAW (G. J.), 1871.

Savings Banks, Belgium, for Miners, 1879, &c. BELGIUM, p. 117.

—— Deposits in Naval Savings Banks, 1891–2. PARLIAMENTARY..Papers, p. 466.

BAROMETERS. MÜLLER (F. C. G.), 1889.

Aneroid Barometer. DENT (E. J.), 1848–'49. App. 554. Construction. FRODSHAM, 1849; PLYMPTON, 1881. Directions for use, DIXEY, 1892; WHYMPER (E.), 1891. Description. BELVILLE (J. H.) 1849. App. 547. Newly invented portable barometer. DENT, 1849. Remarks, FRODSHAM (C.), 1849, p. 558.

Barometers at a constant level and a variable level. DELCROS, 1841.

Barometric Tables for engineers, geologists, and scientific travellers. GALBRAITH (W.), 1833.

Board of Trade Manual, 1871. METEOROLOGICAL Office, p. 346.

Coast or fishery barometer Manual, 1869. METEOROLOGICAL Office, p. 346.

Companion to the Mountain Barometer. JONES (T.), 1820.

Comparison of Schuckburgh and Col. Roy's Rules for the measurement of heights with the barometer. SHUCKBURGH (Sir G.), 1778. App. 576.

Constants of the Barometric Formulae which make allowance for the hygrometric state of the Atmosphere. RENNIE (H. L.), 1859.

Critical history of the Barometer. Its construction, etc. DELUC (J. A.), 1772. App. 553.

Determination of heights from Barometer readings. AIRY (Sir G. B.), 1867, p. 19. For measuring the height of mountains and the depth of mines. MAGELLAN, 1779. Observations made in Savoy in order to ascertain height of mountains by means of the Barometer. SCHUCKBURGH (Sir G.), 1777. App. 576.

BAROMETERS—*continued.*

Diurnal Variation of Barometric Pressure. COLE (F. N.), 1892.
Historical notice of Barometers. DENT, 1849.
Manual. BELVILLE, 1849.
Manual for the use of seamen. METEOROLOGICAL Office, p. 346.
Measurement of Altitudes. RÜHLMANN (R.), 1870.
Mountain Barometer. Method of determining altitudes of every denomination. ENGLEFIELD (Sir H. E.), 1811. App. 556. Tables, calculated and stereoglyphed by Scheutz's Calculating Machine. No. 2. GRAVATT, 1859. A new Barometric Formula for considering the hygrometric condition of the atmosphere for Mountain Heights. RENNY (H. L.), 1857.
Self-registering Barometer. Description of. BRYSON (R.), 1844. App. 550.
Siphon Barometers. AIRY (Sir G. B.), 1861, p. 23.
Table of Barometrical Heights. MACKESY, 1879.
Tables barométriques portatives. BIOT, 1811.
Use of Barometers on Surveys and Reconnaissances. WILLIAMSON (R. S.), 1868.
Variation of Barometer in the climate of Britain. HOWARD (L.), 1847.
Wind Barometer and the Winds. GAMBLE, 1882.

BARRACKS. TOLLET, 1882.
Barracks, etc., drawings constructed under the Barrack Loan Act. SCHOOL of Military Engineering, 1893.
Chatham. Marine Barracks, prices for additional buildings. CHATHAM, 1800.
—— Plan. CHATHAM, 1858, 1879.
Damages. BOYNTON (F.), 1891.
France. For Infantry or Cavalry. HOREAU, 1856.
India. Defects in the New Barracks, Allahabad, 1870. INDIA, p. 109.
Indian Stations, Barracks for. INDIA, 1864, Add 510.
Mediterranean Stations, 1863. PARLIAMENTARY..Papers, p. 466.
Sagar. Failure of the Infantry Barracks, 1872. INDIA, p. 130.
Sanitary Condition, 1861. PARLIAMENTARY..Papers, p. 466.

BARS AT RIVER MOUTHS.
Cause of formation. BROOKS (W. A.), 1863.
Causes of their formation, and on their treatment by "Induced Tidal Scour." MANN (I. J.), 1881.
Danube. Remarks on the comparative conditions of its different mouths and branches. SPRATT (T. A. B.), 1858.
Mersey Bar. Dredging Operations. LYSTER, 1893.

BARS AT RIVER MOUTHS—*continued.*

Mississippi (mouth of the). Various plans for deepening its bar. KNAPP (H. F.), 1876.

New South Wales. Removal of Bars from the estuaries to our Rivers. SHELLSHEAR (W.), 1884.

Port Said, the Entrance to the Suez Canal. Rapid silting in progress. SPRATT (T. A. B.), 1870.

Sandy Hook Bar. Port of New York, deepening. KNAPP (H. F.), 1881.

Teignmouth Bar. Investigation of its movements. SPRATT (T. A. B.), 1856.

Rio Grande do Sul, Brazil. Improvement of the Bar of. BICALHO, 1884; HAUPT (L. M.), 1888.

See also DELTAS.

BASALT. Supposed changes Basaltic Veins have suffered during their passage through and contact with stratified rocks. BELL (Sir I. L.), 1875, p. 120.

BATHS AND WASHHOUSES.

Baths and Washhouses. ASHPITEL and Whichcord, 1853; BALY, 1852; CAPE, 1854.

Public (and private) Baths. SCHULTZE (R.), 1893, '94.

Bath. Public Baths. ARMSTRONG, W. (1838).

France. FRANCE, 1859, p. 435.

Liverpool. Report on Baths and Washhouses. NEWLANDS, J., 1856.

BATTERIES (PRIMARY AND SECONDARY). See ELECTRICITY (Batteries).

BATTLES. Defence of a position selected as a field of battle. FRASER (T.), 1875.

Maps of the battlefield of Gettysburg. GETTYSBURG, 1876.

BEACH. Raised Beach on the Thatcher Rock. HUNT (A. R.), 1888.

BEACONS, BUOYS, SEA LIGHTS, ETC.

Beaconage of the Coast of France. REYNAULD (L.), 1864, 1876.

—— Proposals for the illumination of Beacons and Buoys. STEVENSON (T.), 1870.

Beacons, Buoys, Signals, etc. SAUTTER (L.), 1880.

Buoys and Maritime Lights in England and Scotland. DEGRAND, 1836.

Construction and price of Catadioptric Sea Lights, optical and mechanical portions. WILKINS (W.), 1851.

Dipping and apparent lights for sunken reefs and pierheads of harbours. STEVENSON (T.), 1854.

BEACONS, BUOYS, SEA LIGHTS, ETC.—*continued.*

Dunkirk. DUNKIRK, 1874.

Easy placing of Buoys and Beacons in maritime channels. VAUTHIER, 1879.

France. REYNAUD (L.), 1883.

Gas-illuminated buoy. PINTSCH's Patent Lighting Co., 1879, 1881, 1885.

Goodwin and other Sands. Proposed plan for Refuge beacon on. WORTHINGTON (B.), 1840.

Harbour Lights, Light Buoys and Beacons in Italy. LO GATTO, 1893.

Illumination of beacons at sea by Electricity communicated through wires connected with the shore. Experiments. STEVENSON (T.), 1867.

Lightships. ADAMS (W. H. D.), 1878.

—— Communication between lightship and shore and lightship and lightship. ROTHERY (R. C.), 1881.

—— Lightboats, lightships, gas lighting. PINTSCH's Patent Lighting Company, 1881, 1885.

—— Lightships, Buoys and Beacons. GORDON (A.), 1863.

New Marine Signal Light (Magnesium). THURSTON (R. H.), 1866, p. 310.

Report of Commissioners on Lights, Buoys and Beacons, 1861. PARLIAMENTARY.. Papers, p. 483.

Sounding and luminous buoys. ALLIARD, 1882.

United States Beacons, Buoys, Floating lights, etc. Public Documents, Reports, Laws relating to, etc. UNITED States, p. 350.

See also LIGHTHOUSES.

BEAMS. ZABAGLIA and Fontana, 1743.

Beam, The. BAKER (W. L.), 1892.

Cast-Iron Beams. Essay on the construction of the five architectural sections of. TURNBULL (W.), 1833.

Concrete and Iron Beams. EDWARDS (F. G.), 1894.

Continuous Beams, Theory of. HEPPEL, 1870; RANKINE (W. J. M.), 1870.

—— Solution of problems in Continuous Beams. PERRY (Prof. J.) and AYRTON (W. E.), 1879.

Wrought and Cast iron Beams. DAVIES (T.), 1856.

Wrought Iron Beams. Economic distribution of material in the sides or vertical portion of. BARTON (J.), 1856.

BEAMS (STRAINS IN).

Flexure and Transverse Resistance of Beams. EMERY, 1879.

New Formulas for the loads and deflections of Solid Beams and Girders. DONALDSON (W.), 1872.

BEAMS (STRAINS IN)—*continued.*

Resistance of beams, theory. CLERC, 1880.

Strains in the interior of Beams and Tubular Bridges. AIRY (Sir G. B.), 1862, p. 21.

Strains upon the Diagonals of Lattice Beams. DOYNE and Blood, 1853.

Stress in Beams. Lectures. UNWIN (W. C.), 1868.

Treatise on the Strength and Dimensions of Cast Iron Beams when exposed to transverse strains, etc. TURNBULL (W.), 1831, '32.

See also GIRDERS.

BEAUTY. Greek Principles. JOPLING, 1849.

BELLS.

Constituent parts of Bells. Proportions of. HARRISON (James), 1831. App. 560; HARRISON (John), 1831.

Musical Handbell-Ringer's Instructor. GOSLIN, 1879.

Japan. Prehistoric Bronze Bells. MONROE, 1877.

Westminster Great Bell. BAKER (W. L.), 1857.

BELLS (ELECTRIC). Installation and Maintenance. FOURNIER, 1886.

Practical Electric bell fitting. ALLSOP (E. C.), 1890.

BELTS.

Belts and Pulleys. CROMWELL, 1885.

Belt Driving. HALLIDAY (G.), 1894. Add. 505.

Table of the power of Leather Belting and Shafts. HETT, 1889.

BIBLE. New Manual of Biblical Cosmography. HAMPDEN (J.), 1877.

BIBLIOGRAPHY.

American (North) Invertebrate Paleontology. Supplement to the bibliography of. WHITE (C. A.) and Nicholson, 1879.

American (North) Mammals. GILL (T.) and Coues, 1877. Mesozoic Invertebrata. BOYLE (C. B.), 1893; BOYLE, Add. 486.

Annual Literary Index. FLETCHER and Bowker, 1893, &c.

Architecture, Mechanical Engineering and military and naval science. Catalogues of books on. WEALE (J.), 1860, 1861.

Architecture and Engineering. Statistical notices of publications on. WEALE (J.), 1859.

Astronomical Bibliography. LA LANDE (J. J. le F. de), 1803. App. 565.

Best Books. SONNENSCHEIN (W. S.), 1891.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Plans for connecting by a navigable canal. GLYNN, 1849.

Practicability and Importance of a Ship Canal to connect the Atlantic and Pacific Oceans.
ATLANTIC and Pacific Ship Canal, 1855.

Practicability of a Ship Canal without locks by the valley of the Atrato. KELLEY (F. M.), 1856, '57; PITMAN (R. B.), 1825.

Proposed American Inter-Oceanic Canal in its Commercial Aspects. NIMMO (J.), 1880. Add. 523.

Proposed Inter-oceanic Ship Canal across the American Isthmus.
AMMEN (D.), 1878.

Proposed lines for Inter-oceanic Canals and Railroads.
DAVIS (C. H.), 1866.

Reports on the Studies of the International Commission of Exploration of the American Isthmus.
WYSE (L. N. B.), Reclus and Sosa, 1879.

Surveys for a Ship Canal across the American Isthmus.
AMMEN (D.), 1876.

United States Ship Canal Company. Destruction of Greytown by the United States Corvette "Cyane," July 13, 1854.
CARMICHAEL (J.), 1856.

Darien Canal.

A Darien *v.* the Suez Canal. DARIEN Canal, 1876.

Darien Inter-oceanic Canal. DARIEN Canal, 1876.

Expedition against the Isthmus of Darien under the Command of Sir G. M. McGregor. WEATHERHEAD (W. D.), 1821.

Explorations and Surveys. DARIEN Canal, 1874.

Gulf of Darien and Pacific Ocean Ship Canal and Steam Navigation Company. Prospectus, 1845. GULF of Darien.

Isthmus of Darien in 1852. GISBORNE.

Isthmus of Darien Ship Canal. History, letters and reports.
CULLEN, 1853, '56, '57.

Memorial to William III. on Darien and the rise and decline of Commerce. PATERSON (W.), 1852.

Report on the studies of the International Commission for the exploration of the Darien Isthmus. WYSE (L. N. B.), 1877.

Societies founded in Paris for its colonisation and canalisation.
SAMPER (J.), 1862.

Survey for an Inter-oceanic Ship Canal. DARIEN Canal, 1861.

Eads Railway. See *Tehuantepec.*

Honduras Railway.

Honduras Inter-oceanic Railway. BROOKS (W. A.), 1874; HONDURAS, 1872. Reports, etc. SQUIER (E. G.), 1854–57.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Nicaragua Canal.

At the Paris Exhibition of 1889. NICARAGUA.
Atlantic and Pacific Railway through Nicaragua. ATLANTIC and Pacific Railway, 1866.
Bird's-eye View of the Interoceanic Canal of Nicaragua and Costa Rica. LEUTHNER.
Contract, 1863. NICARAGUA.
Convention, 1850. Proposed Convention, 1859. Convention, 1869. NICARAGUA.
Description of Route, estimated cost and business, 1886. NICARAGUA.
Distance saved by the Nicaragua and Costa Rica Canal. NICARAGUA.
Maritime Gateway to the Pacific. THWAITE, 1893.
Mosquito, Nicaragua and Costa Rica. MOSQUITO, 1849.
Nicaragua and the Filibusters, 1856. NICARAGUA.
Nicaragua Canal. AMMEN (D.), 1886; BOUNICEAU, 1879.
Nicaragua Canal, 1846. NICARAGUA.
Nicaragua proposed interoceanic canal and projected routes. SQUIER (E. G.), 1851, 1852.
Nicaragua Railway, 1866. NICARAGUA.
Nicaraguan Railway Route. MAURY, 1866.
Piercing of the isthmus by the Nicaragua Canal. BELLY, 1858.
Plans, etc. THOMÉ de Gamond (A.), 1858.
Possible effects of earthquake shocks on the structure of the Canal. DUTTON (C. E.), 1891.
Profile, 1888. NICARAGUA.
Railway Concession to Capt. Bedford Pim, 1865. NICARAGUA.
Report and estimate of cost. COLLINSON (J.), 1866.
Report of British Engineers, 1852. NICARAGUA.
Report of Engineers of Canal Construction Co., 1889. NICARAGUA Canal; NICARAGUA Canal, 1893. Add. 523; MENOCAL (A. G.), 1893. Add. 520.
Report of Executive Committee, 1880. NICARAGUA.
Report of the U.S. Nicaragua Surveying Party, 1885. MENOCAL, 1886.
Sanitary notes on. BRANSFORD, 1883.
Ship Canals through Nicaragua. ATLANTIC and Pacific Steam Navigation Company, 1859.
Survey and estimates of cost. Map and profile of route. CHILDS (O. W.), 1852.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Panama Canal.

Canal of junction. BOUNICEAU, 1879; GARELLA, 1845

Compagnie universelle du Canal interocéanique de Panama, Projet de loi, 1886. PANAMA. Correspondence. LESSEPS (F. de & C. A. de), 1888. PANAMA, 1882.

Facilities for a Ship Canal through the Isthmus of Panama. LLOYD (J. A.), 1850.

Inspection, 1886. BIGELOW (Hon. J.).

Instructions to captains and pursers of Central American Steamers, 1862. PANAMA Railroad.

Intercourse between Great Britain and the Western Coast of South America *viâ* Panama. LIMA, 1836.

Isthmus of Panama. CHAMBERS (W. & R.); CHEVALIER, 1884; GRISWOLD, 1852; PANAMA, 1850. History. SEEMANN (B.), 1867.

Isthmus of Panama, Panama Railroad and Pacific Mail Steamship Co. OTIS, 1867.

Lesseps and his Canal. AMMEN (D.), 1880.

New Granada and the United States Diplomatic Controversy. PANAMA, 1857.

Panama and San Blas routes. A comparative view. SHELBOURNE (S. F.), 1880. San Blas Route. Inter-oceanic Ship Canal. SHELBOURNE (S. F.), 1880.

Panama Canal. DIRKS, 1880; DUMAS (A.), 1891; HERSENT, 1882; HILL (H. R.), 1845; KOEP, 1886. Historical, technical, and financial. PAPONOT, 1888, '89, '90. History, etc. RODRIGUES (J. C.), 1885. WYSE (L. N. B.), 1886; ZÖLLER (H.), 1882. Letters of an Engineer. PANAMA, 1887.

Panama Railroad Company. Report, &c., 1855. PANAMA Railroad.

Panama Ship Canal and Inter-oceanic Ship Railway Project. GOODWIN (J. M.), 1880.

Past, present, and future. BUNAU-Varilla, 1892.

Progress of Work on the Panama Canal during 1885. KIMBALL.

United States and the Panama Canal. GUSTAFSON, 1882.

Wheel carriage road across. ALLSOPP, 1834.

Working of the Panama Canal. COSSOUX, 1888.

Tehuantepec Railway.

Advantages it possesses over all other routes across the American isthmus, with reports of engineers. STEVENS (S.), 1871, 1872.

Eads Ship Railway. EADS, 1881.

Isthmus of Tehuantepec in the Republic of Mexico. DALE (R.), 1851; O'GORMAN, 1846. Survey, etc. BARNARD (J. G.), 1852; MORO, 1844, '45, '49.

ATLANTIC AND PACIFIC, JUNCTION OF—*continued.*

Isthmian Ship Railway. CORTHELL, 1886.

Proposed Tehuantepec Ship Railway. PHELPS (S. L.), 1881.

Report on, and its practicabilities and commercial features. TEHUANTEPEC Ship Rly., 1883, '84.

Report on the subject of a ship canal across. WILLIAMS (J. J.), 1870.

Reports on explorations, etc., to ascertain its practicability. SHUFELDT (R. W.), 1872.

Ship Railway across the isthmus of Tehuantepec. EADS, 1882, 1886.

Tehuantepec Railway, its location, features and advantages. STEVENS (S.), 1869, 1873; WILLIAMS (J. J.), 1870.

Tehuantepec Ship Railway. CORTHELL, 1884.

Transunion and Tehuantepec Route between Europe and Asia. BURWELL (W. M.), 1851.

ATLAS. *See* MAPS.

ATOMS. Motion of Atoms. SMYTHIES (J. K.), 1885.

ATTRACTION. Attraction Theory. SMYTHIES (J. K.), 1850.

Certain limitations of the law of Newtonian attraction. COLLIGNON, 1886.

ATTRITION, Resistance to. MAGANZINI, 1878.

AUTOMATA.

Automata: Old and new. COOKE (C. W.), 1893.

Automaton Chess player (Kempelen's). ANONYMOUS, 1772. App. 544; BOOTH (J.), 1821. App. 549; WINDISCH (C. G. von), 1783. App. 581.

Automaton Chess-player redivivus. ANONYMOUS, 1830. App. 544.

B.

"BACCHANTE" (H.M.S.) Cruise. — ALBERT Victor, 1886.

BACTERIA. — MAGNIN and Sternberg, 1884.
Germ Theory. — SANDERS (L.), 1889.
See also DISINFECTION.

BALANCE.
Balance Beam. — AGUDIO, 1887.
Torsion Balance. — ZIMMERMANN (W. F.) 1885.

BALLISTICS. *See* ARTILLERY (Ballistics).

BALLOONS AND BALLOONING. Account of the first Aerial Voyage in England, 1784. — LUNARDI.
Aeronautical expedition from London to Weilburg. — MASON (Monck), 1836, '37.
Aeronautical Society of Great Britain. — AERONAUTICAL Society; BREAREY, 1866.
Air-balloons and fire-balloons. — CASSÉ, 1883.
Balloons and celebrated aeronauts, 1783–1890, History. — TISSANDIER (G.)
Captive Balloons. Application of steam. — MOREAUD, 1863.
Copper Air-balloon. — MAREY-MONGE, 1845.
Dirigible. — GRAFFIGNY, 1888.
First German Balloon in Berlin. — KÖNIG.
Five Balloon Ascents in 1863. — GLAISHER.
Giant Balloon; account of its construction, notices on the screw applied to aerial navigation. — SILAS (F.), 1863.
History and principles. — MAY (G.), 1885.
History and practice of Aerostation. — CAVALLO, 1785.
Navigable Balloons. — TISSANDIER (G.), 1872.
Photography from Balloons. — TISSANDIER (G.), 1886.
Possibilities of Ballooning. — BURNABY, 1884.
Proposition for a balloon railway across the Sahara Desert. — BROWNE (J.), 1850.
Travels in the Air. — GLAISHER, 1871.
Use in War. — ESPITALLIER, 1888.
Winged (The) Aerostat. — ARMOUR (1885).
See also AERIAL NAVIGATION.

BANKS AND BANKING. Bank Charter Act, Monetary Panics and their remedy. GASSIOT, 1867.

Bank Note and Banking Reform. GREIG, 1880.

Banking and the application of recent inventions to its purposes. SHARP (Granville), 1852.

Clearing-house, statistics of, BABBAGE (C.), 1856, p. 78.

Facts and reasons in favour of Joint Stock Banks. FARREN, 1833.

Ireland. Joint Stock Banking in, Inquiry into the state of, particularly as regards the effects of the Bank of Ireland monopoly. LOYAL National Repeal Assoc., 1884. Add. 516.

Joint Stock Banks. Reports, 1836–38. PARLIAMENTARY..Papers, p. 466.

Law of Bankers' Cheques, letters of credit and drafts. SHAW (G. J.), 1871.

Savings Banks, Belgium, for Miners, 1879, &c. BELGIUM, p. 117.

—— Deposits in Naval Savings Banks, 1891–2. PARLIAMENTARY..Papers, p. 466.

BAROMETERS. MÜLLER (F. C. G.), 1889.

Aneroid Barometer. DENT (E. J.), 1848–'49. App. 554. Construction. FRODSHAM, 1849; PLYMPTON, 1881. Directions for use, DIXEY, 1892; WHYMPER (E.), 1891. Description. BELVILLE (J. H.) 1849. App. 547. Newly invented portable barometer. DENT, 1849. Remarks, FRODSHAM (C.), 1849, p. 558.

Barometers at a constant level and a variable level. DELCROS, 1841.

Barometric Tables for engineers, geologists, and scientific travellers. GALBRAITH (W.), 1833.

Board of Trade Manual, 1871. METEOROLOGICAL Office, p. 346.

Coast or fishery barometer Manual, 1869. METEOROLOGICAL Office, p. 346.

Companion to the Mountain Barometer. JONES (T.), 1820.

Comparison of Schuckburgh and Col. Roy's Rules for the measurement of heights with the barometer. SHUCKBURGH (Sir G.), 1778. App. 576.

Constants of the Barometric Formulae which make allowance for the hygrometric state of the Atmosphere. RENNIE (H. L.), 1859.

Critical history of the Barometer. Its construction, etc. DELUC (J. A.), 1772. App. 553.

Determination of heights from Barometer readings. AIRY (Sir G. B.), 1867, p. 19. For measuring the height of mountains and the depth of mines. MAGELLAN, 1779. Observations made in Savoy in order to ascertain height of mountains by means of the Barometer. SCHUCKBURGH (Sir G.), 1777. App. 576.

BAROMETERS—*continued.*

Diurnal Variation of Barometric Pressure. COLE (F. N.), 1892.
Historical notice of Barometers. DENT, 1849.
Manual. BELVILLE, 1849.
Manual for the use of seamen. METEOROLOGICAL Office, p. 346.
Measurement of Altitudes. RÜHLMANN (R.), 1870.
Mountain Barometer. Method of determining altitudes of every denomination. ENGLEFIELD (Sir H. E.), 1811. App. 556. Tables, calculated and stereoglyphed by Scheutz's Calculating Machine. No. 2. GRAVATT, 1859. A new Barometric Formula for considering the hygrometric condition of the atmosphere for Mountain Heights. RENNY (H. L.), 1857.
Self-registering Barometer. Description of. BRYSON (R.), 1844. App. 550.
Siphon Barometers. AIRY (Sir G. B.), 1861, p. 23.
Table of Barometrical Heights. MACKESY, 1879.
Tables barométriques portatives. BIOT, 1811.
Use of Barometers on Surveys and Reconnaissances. WILLIAMSON (R. S.), 1868.
Variation of Barometer in the climate of Britain. HOWARD (L.), 1847.
Wind Barometer and the Winds. GAMBLE, 1882.

BARRACKS. TOLLET, 1882.
Barracks, etc., drawings constructed under the Barrack Loan Act. SCHOOL of Military Engineering, 1893.
Chatham. Marine Barracks, prices for additional buildings. CHATHAM, 1800.
—— Plan. CHATHAM, 1858, 1879.
Damages. BOYNTON (F.), 1891.
France. For Infantry or Cavalry. HOREAU, 1856.
India. Defects in the New Barracks, Allahabad, 1870. INDIA, p. 109.
Indian Stations, Barracks for. INDIA, 1864, Add 510.
Mediterranean Stations, 1863. PARLIAMENTARY..Papers, p. 466.
Sagar. Failure of the Infantry Barracks, 1872. INDIA, p. 130.
Sanitary Condition, 1861. PARLIAMENTARY..Papers, p. 466.

BARS AT RIVER MOUTHS.
Cause of formation. BROOKS (W. A.), 1863.
Causes of their formation, and on their treatment by "Induced Tidal Scour." MANN (I. J.), 1881.
Danube. Remarks on the comparative conditions of its different mouths and branches. SPRATT (T. A. B.), 1858.
Mersey Bar. Dredging Operations. LYSTER, 1893.

BARS AT RIVER MOUTHS—*continued.*

Mississippi (mouth of the). Various plans for deepening its bar. KNAPP (H. F.), 1876.

New South Wales. Removal of Bars from the estuaries to our Rivers. SHELLSHEAR (W.), 1884.

Port Said, the Entrance to the Suez Canal. Rapid silting in progress. SPRATT (T. A. B.), 1870.

Sandy Hook Bar. Port of New York, deepening. KNAPP (H. F.), 1881.

Teignmouth Bar. Investigation of its movements. SPRATT (T. A. B.), 1856.

Rio Grande do Sul, Brazil. Improvement of the Bar of. BICALHO, 1884; HAUPT (L. M.), 1888.

See also DELTAS.

BASALT. Supposed changes Basaltic Veins have suffered during their passage through and contact with stratified rocks. BELL (Sir I. L.), 1875, p. 120.

BATHS AND WASHHOUSES.

Baths and Washhouses. ASHPITEL and Whichcord, 1853; BALY, 1852; CAPE, 1854.

Public (and private) Baths. SCHULTZE (R.), 1893, '94.

Bath. Public Baths. ARMSTRONG, W. (1838).

France. FRANCE, 1859, p. 435.

Liverpool. Report on Baths and Washhouses. NEWLANDS, J., 1856.

BATTERIES (PRIMARY AND SECONDARY). See ELECTRICITY (Batteries).

BATTLES. Defence of a position selected as a field of battle. FRASER (T.), 1875.

Maps of the battlefield of Gettysburg. GETTYSBURG, 1876.

BEACH. Raised Beach on the Thatcher Rock. HUNT (A. R.), 1888.

BEACONS, BUOYS, SEA LIGHTS, ETC.

Beaconage of the Coast of France. REYNAULD (L.), 1864, 1876.

—— Proposals for the illumination of Beacons and Buoys. STEVENSON (T.), 1870.

Beacons, Buoys, Signals, etc. SAUTTER (L.), 1880.

Buoys and Maritime Lights in England and Scotland. DEGRAND, 1836.

Construction and price of Catadioptric Sea Lights, optical and mechanical portions. WILKINS (W.), 1851.

Dipping and apparent lights for sunken reefs and pierheads of harbours. STEVENSON (T.), 1854.

BEACONS, BUOYS, SEA LIGHTS, ETC.—*continued.*

Dunkirk. DUNKIRK, 1874.

Easy placing of Buoys and Beacons in maritime channels. VAUTHIER, 1879.

France. REYNAUD (L.), 1883.

Gas-illuminated buoy. PINTSCH's Patent Lighting Co., 1879, 1881, 1885.

Goodwin and other Sands. Proposed plan for Refuge beacon on. WORTHINGTON (B.), 1840.

Harbour Lights, Light Buoys and Beacons in Italy. LO GATTO, 1893.

Illumination of beacons at sea by Electricity communicated through wires connected with the shore. Experiments. STEVENSON (T.), 1867.

Lightships. ADAMS (W. H. D.), 1878.

—— Communication between lightship and shore and lightship and lightship. ROTHERY (R. C.), 1881.

—— Lightboats, lightships, gas lighting. PINTSCH's Patent Lighting Company, 1881, 1885.

—— Lightships, Buoys and Beacons. GORDON (A.), 1863.

New Marine Signal Light (Magnesium). THURSTON (R. H.), 1866, p. 310.

Report of Commissioners on Lights, Buoys and Beacons, 1861. PARLIAMENTARY..Papers, p. 483.

Sounding and luminous buoys. ALLIARD, 1882.

United States Beacons, Buoys, Floating lights, etc. Public Documents, Reports, Laws relating to, etc. UNITED States, p. 350.

See also LIGHTHOUSES.

BEAMS. ZABAGLIA and Fontana, 1743.

Beam, The. BAKER (W. L.), 1892.

Cast-Iron Beams. Essay on the construction of the five architectural sections of. TURNBULL (W.), 1833.

Concrete and Iron Beams. EDWARDS (F. G.), 1894.

Continuous Beams, Theory of. HEPPEL, 1870; RANKINE (W. J. M.), 1870.

—— Solution of problems in Continuous Beams. PERRY (Prof. J.) and AYRTON (W. E.), 1879.

Wrought and Cast iron Beams. DAVIES (T.), 1856.

Wrought Iron Beams. Economic distribution of material in the sides or vertical portion of. BARTON (J.), 1856.

BEAMS (STRAINS IN).

Flexure and Transverse Resistance of Beams. EMERY, 1879.

New Formulas for the loads and deflections of Solid Beams and Girders. DONALDSON (W.), 1872.

BEAMS (STRAINS IN)—*continued.*

Resistance of beams, theory. CLERC, 1880.

Strains in the interior of Beams and Tubular Bridges. AIRY (Sir G. B.), 1862, p. 21.

Strains upon the Diagonals of Lattice Beams. DOYNE and Blood, 1853.

Stress in Beams. Lectures. UNWIN (W. C.), 1868.

Treatise on the Strength and Dimensions of Cast Iron Beams when exposed to transverse strains, etc. TURNBULL (W.), 1831, '32.

See also GIRDERS.

BEAUTY. Greek Principles. JOPLING, 1849.

BELLS.

Constituent parts of Bells. Proportions of. HARRISON (James), 1831. App. 560; HARRISON (John), 1831.

Musical Handbell-Ringer's Instructor. GOSLIN, 1879.

Japan. Prehistoric Bronze Bells. MONROE, 1877.

Westminster Great Bell. BAKER (W. L.), 1857.

BELLS (ELECTRIC). Installation and Maintenance. FOURNIER, 1886.

Practical Electric bell fitting. ALLSOP (E. C.), 1890.

BELTS.

Belts and Pulleys. CROMWELL, 1885.

Belt Driving. HALLIDAY (G.), 1894. Add. 505.

Table of the power of Leather Belting and Shafts. HETT, 1889.

BIBLE. New Manual of Biblical Cosmography. HAMPDEN (J.), 1877.

BIBLIOGRAPHY.

American (North) Invertebrate Paleontology. Supplement to the bibliography of. WHITE (C. A.) and Nicholson, 1879.

American (North) Mammals. GILL (T.) and Coues, 1877. Mesozoic Invertebrata. BOYLE (C. B.), 1893; BOYLE, Add. 486.

Annual Literary Index. FLETCHER and Bowker, 1893, &c.

Architecture, Mechanical Engineering and military and naval science. Catalogues of books on. WEALE (J.), 1860, 1861.

Architecture and Engineering. Statistical notices of publications on. WEALE (J.), 1859.

Astronomical Bibliography. LA LANDE (J. J. le F. de), 1803. App. 565.

Best Books. SONNENSCHEIN (W. S.), 1891.

BIBLIOGRAPHY—*continued.*

Bibliographer's Manual of English Literature. LOWNDES (W. J.), 1871.
—— Supplement, 1846–1849. ANONYMOUS, p. 48.
Bibliotheca Britannica; or a general index to British and Foreign Literature. WATT (R.), 1824.
Bibliotheca Mechanico-technologica. ENGELMANN, 1844.
Bibliotheca Polytechnica. SZCZEPAŃSKI, 1890.
Books and the housing of them. GLADSTONE (W. E.), 1890.
British Catalogue, 1837–49. ANONYMOUS, p. 48.
Building. BALDAMUS, 1875.
Building and Engineering. GEROLD and Co., 1865–77.
Catalogue of the Librairie française. REINWALD (C.), 1859–70.
—— Catalogue, general, of the Librairie française, 1866–85. LORENZ.
Catalogue of Books (current literature). ANONYMOUS, 1889, p. 42.
Catalogue of Scientific Papers of the Royal Society. ROYAL Society, 1867, &c.
Catalogues of Scientific serials. SCUDDER (S. H.), 1879.
Chemistry, 1492–1892. BOLTON (H. C.).
Climate and Meteorology of South Africa. Catalogue of Books. GAMBLE, 1885.
Cornwall. Bibliotheca Cornubiensis. BOASE and Courtney, 1874.
Decimal Classification and relative Index for Libraries, &c. DEWEY (M.), 1891.
Earthquakes. POWNALL (C. A. W.), 1891.
Electricity, Magnetism, etc., Catalogue of books and papers relating to. RONALDS (Sir F.), 1880.
Electricity and Magnetism, 1860–83. MAY (G.).
English Catalogue, 1835. ANONYMOUS, p. 48.
Fossil Insects. Bibliography of. SCUDDER (S. H.), 1890.
French Industrial Publications. THIRION (C.), 1867.
Geology of Hertfordshire. List of works, 1874–83. HOPKINSON (J.), F.L.S., 1885.
Geology of the Missouri. SAMPSON (F. A.), 1890.
Geology, Palæontology, Mineralogy of Australia and Tasmania. Catalogue of works, &c., on. ETHERIDGE and Jack, 1881.
Guide Book to Technical Literature. BIRCH (J.) and Co., 1891.
Handy Lists of Technical Literature. Engineering and Mechanics. HAFERKORN and Heise, 1890.
How to form a Library. WHEATLEY (H. B.), 1886.
Index to Engineering Periodicals, 1883 to 1887. GALLOUPE, 1888.
Inundations. Books on. CHAMPION, 1858–64.
Languages. Algonquian languages. PILLING, 1891; SMITHSONIAN Inst.

BIBLIOGRAPHY—*continued.*

Languages. Athabascan languages. PILLING, 1892; SMITHSONIAN Inst.

—— Chinookan languages. PILLING, 1893; SMITHSONIAN Inst.

—— Iroquoin languages. PILLING, 1888; SMITHSONIAN Inst.

—— Muskhogean languages. PILLING, 1889; SMITHSONIAN Inst.

—— Salishan languages. PILLING, 1893; SMITHSONIAN Inst.

—— Wakashan languages. PILLING, 1894; Add. 528.

Library. A magazine of bibliography. PERIODICAL PUBLICATIONS, p. 18.

List of Scientific Papers and Works of T. M. Reade. READE, 1890.

Literature of Measurement. ASSOCIATION Géodésique, 1876. Add. 482.

London Catalogue of Books. 1814–1839. ANONYMOUS, p. 48.

Mathematics. List of Cayley's Mathematical Works. 1841–62. CAYLEY.

—— Index to papers in pure mathematics in journals and transactions, English and foreign. 19th century. CARR (G. S.), 1886.

Metallurgy. BALDAMUS, 1875.

Mining. BALDAMUS, 1875.

Monthly Record of Scientific Literature. PERIODICAL PUBLICATIONS, p. 19.

Natural History, Physics, Chemistry and Mathematics, 1874–77. METZGER.

Panizzi's Bibliographical Notes. Defence of the Resolution for omitting them from the Royal Society Catalogue. PANIZZI (Sir A.), 1838. App. 571.

Pantobiblion. PERIODICAL PUBLICATIONS, p. 20.

Publishers' Trade list Annual. PERIODICAL PUBLICATIONS, p. 22.

Railways. BALDAMUS, 1875.

Repertory of technical, mathematical and scientific periodical literature. SCHOTTE (F.), 1869–71.

Repertory of technical literature, 1854, etc. (1882–86). KERL, 1871.

Technical Arts. MEULEN, 1850–75.

Telegraphs. BALDAMUS, 1875.

United States Geological Survey Publications. Bibliography and Index. WARMAN (P. C.), 1893.

See also CATALOGUES OF LIBRARIES.

BILLIARD TABLES. MARSDEN (T.), 1883.

BIMETALLISM. *See* CURRENCY.

BIOGRAPHIES (GENERAL).

American Civil and Military Engineers' Lives and Works. STUART (C. B.), 1871.
Architects and Engineers. TRÉLAT (E.), 1885.
Astronomers, obituary notices. DUNKIN, 1879.
Biograph and Review. PERIODICAL PUBLICATIONS, p. 12.
Biographia Britannica Literaria. Prospectus. ANONYMOUS, 1839, p. 41.
Biographical Dictionary. WALLER (J. F.) and others, 1868.
Biographical Dictionary of the History of Science. POGGENDORFF, 1863.
Bishops of the See of Bath and Wells. BRITTON, 1847.
Celebrities at Home. YATES (E.), 1877–79.
Character. Duty. Industrial Biography. Men of Invention and Industry. Self Help. SMILES (S.), 1863, 1874, 1880, 1884, 1875.
Collection of portraits and biographies of men of worth. BREMONTIER, 1839.
Dictionary. CATES, 1881.
Dictionary of National Biography. STEPHEN (L.) and Lee, 1885.
Electricians, Lives. JEANS (W. T.), 1887; MUNRO (J.), 1890.
Engineers. SMILES (S.), 1862.
Engineers of the Ponts et Chaussées. TARBÉ de St. Hardouin (F. P. H.), 1884.
Men of Science of Great Britain living in the years 1807–8. WALKER (William), Junior, 1862.
Men of the Time. COOPER (Thompson), 1875, '84.
Military (modern). CHESNEY (C. C.).
Naval Biographical Dictionary. O'BYRNE, 1849, 1861.
Pioneers of Science. LODGE, 1893.

BIOGRAPHIES (SPECIAL).

Achard (F. K. A.). ACHARD, 1887.
Adams (William), Cardiff. NEEDHAM, 1887.
Airy (Sir G. B.). TURNER (H. H.), 1892.
Allen (Horatio). FORNEY, 1890.
Anderson (Sir J.). Statement of services. ANDERSON (Sir J.), 1873.
André (F.) ANDRÉ, 1889.
Archer (Francis). READE (T. M.), 1892.
Arkwright (Sir R.). Disproval of his claim to the invention of machinery in Cotton Manufacture. GUEST, 1823.
Arnold (John). ABBOTT (C.), 1842. App. 543.
Babbage (Charles). BABBAGE, 1864.

BIOGRAPHIES (SPECIAL)—*continued.*

Baillairgé (C. P. F.). BAILLAIRGÉ, 1881.
Baily (Francis). HERSCHEL (Sir J. F. W.), 1844; HERSCHEL, 1845. App. 562.
Baird (Charles and Francis). TOWER (T.), 1867.
Baranowski (J. J.). BARANOWSKI, 1881.
—— His mechanical inventions and literary works. BARANOWSKI, 1886.
Barré (Lieut.-Col. I.). BRITTON, 1848.
Barry (Sir Charles). BARRY (Rev. A.), 1868.
Beaufort (Admiral Sir F.). BEAUFORT, 1868.
Bell (C. D.). SMYTH (C. P.), 1883.
Bell (Henry). Introducer of the steamboat into Great Britain and Ireland. MORRIS (E.), 1844.
Bentham (Sir S.). Services rendered to the civil department of the Navy. BENTHAM, 1814.
Berthoud (Ferdinand). ABBOTT (C.), 1842. App. 543.
Berthoud (Louis). ABBOTT (C.), 1842. App. 543.
Bischoff (T. L. W. von). KUPFFER, 1884.
Booth (Henry). SMILES (R.), 1869, p. 208.
Boulton (Matthew). SMILES (S.), 1866.
Boyle (Robert). SAUNDERS (L.), 1885.
Brassey (Thomas). HELPS, 1872.
Breguet (Abraham Louis). ABBOTT (C.), 1842. App. 543.
Brewster (Sir David). Home life. GORDON (Mrs. M. M.), 1870.
Bridgewater (Duke of). Public character. EGERTON, 1818–20.
Brindley (J.) EGERTON, 1818–20.
Britton (John). Autobiography. BRITTON, 1849–50.
—— Britton testimonial, 1846. JONES (T. E.); MITFORD.
Brogden (John). SMILES (S.), 1872.
Brunel (I. K.). BRUNEL (I.), 1870; FLACHAT, 1859.
Brunel (Sir M. I.). BEAMISH, 1862; FREERE, 1850.
Brunings (Christian). CONRAD (F. W.), 1827.
Bucknall (H. L.). BUCKNALL, 1878.
Bury (E.). BURY, 1860.
Cantor (Dr.). FAVARO, 1876.
Carey (Henry C.) ELDER, 1880.
Carpenter (John). Town clerk of London. BREWER, 1836.
Cavalieri (Bonaventura). PIOLA, 1844.
Cavendish (Hon. Henry). CAVENDISH Society, 1851; WILSON (G.), 1851.
Caxton (W.). CAXTON, 1852.
Chadwick (Sir Edwin). RICHARDSON (Sir B. W.), 1887. Public services. CHADWICK, 1888, p. 234.

BIOGRAPHIES (SPECIAL)—*continued.*

Chevreul (M.). Address on the occasion of his centenary, 1886. ACADÉMIE des Sciences.

Chordal's Letters, Extracts from. SEE (J. W.), 1885.

Cialdi (A.). Notice of his works. CIALDI, 1877, p. 255.

Claudet (A.), F.R.S. CLAUDET, 1868.

Clericetti (Prof. C.). CLERICETTI, 1887.

Clifford (W. K.). CLIFFORD, 1886.

Cockerill (John). LECOCQ, 1854.

Codrington (Admiral Sir E.). BOURCHIER (Lady).

Cole (William). COLE (W.), 1797. App. 552.

Collignon (M.C.E.). Life and works. KRANTZ, 1886.

Cort (Henry). Petition to the Commons of the United Kingdom. CORT (C.), 1856.

—— Inventions. CORT (H.), 1859.

—— Review of Report of the Committee of the House of Commons on petition respecting his services to the iron trade. CORT (R.), 1855.

Croll (A. A.) (Banquet and Testimonial), 1872. UNITED Kingdom Electric, etc.

Crompton (Samuel). Inventor of the Spinning Mule. FRENCH (G. J.), 1859.

Cubitt (Thomas). BRITTON, 1856.

Culmann (Carlo). FAVARO, 1882.

Dalton (John). CAVENDISH Society, 1854. Scientific researches. HENRY (W. C.), 1854.

Davey (Edward) and the Electric Telegraph. FAHIE, 1883.

Davy (Sir Humphry). DAVY'S Works, vol. 1; PARIS (J. A.), 1831.

Dawson (R.). Services as chief agent of the Australian Agricultural Company. DAWSON, 1829.

Delprat (Dr. J. P.). BORDES (J. P.), &c., 1882.

Denny (W.). Ship builder. BRUCE (A. B.), 1888.

—— Answers to chapters 19, 20, and 21, of his life. RIBES (S.), 1889.

Dixon (J.). Claim against the Portuguese Government. DIXON, 1882.

Dollond (J.), F.R.S. KELLY (J.), 1808. Discovery in connection with improvements in Refracting Telescopes. DOLLOND, 1789.

Drake (Sir Francis). His chair. RIGAUD (S. P.), 1835; 1830. App. 574.

Du Barry (J. N.). DU BARRY (J. N.), 1893. Add. 497.

Dugdale (Sir W.). Life, diary, and correspondence. DUGDALE, 1827.

BIOGRAPHIES (SPECIAL)—*continued.*

Dupuy de Lôme. PARIS (E. E.), 1885.
Durand-Claye (Alfred), 1841–88. DURAND-CLAYE (E.).
Eads (James B.). EADS, 1887. Meeting of the Western Society of Engineers to co-operate in erecting a monument to. CORTHELL, 1890.
—— Paper on the proposition. CORTHELL, 1891.
Ebelmen (J. J.). EBELMEN, 1850, 1855.
Edison (T. A.). His inventions. EDISON, 1889. Life and Inventions. DICKSON (W. K. L.), 1894. Add. 496.
Eiffel (G.). NANSOUTY, 1889.
Elder (John). RANKINE (W. J. M.), 1871.
Emerson (W.). EMERSON (W.), 1793.
Enderby (C.). Dinner to him. ENDERBY, 1849.
England (Lieut.-Gen. Sir R.), G.C.B. NAPIER (Sir C.), 1858.
Ericsson (John). CHURCH (W. C.), 1890; SLABY (A.), 1890.
Ernst (Friedrich Wilhelm). ERNST (F. W.), 1894. Add. 499.
Evans (Admiral G.). Services. EVANS, 1870.
Fairbairn (Sir W.). FAIRBAIRN, 1877, '78, p. 402.
Faraday (Michael). GLADSTONE (J. H.), 1873. Faraday as a discoverer. TYNDALL (J.), 1877 and 1884, p. 334. Life and Letters. JONES (Henry B.), 1870.
Ferguson (J.). FERGUSON (J.), 1778. App. 557.
Fernandez (P.). FERNANDEZ, 1836.
Firbank (Joseph). Railway Contractor. McDERMOTT, 1887.
Fitch (John). Inventor of the Steamboat. WESTCOTT (T.), 1857.
Flachat (Eugène). MALO, 1874.
Flamsteed (John). WHEWELL, 1836.
Fournet (J. J.). FOURNET, 1870.
Francis (James Bicheno). FITZGERALD (D.), Davis and Freeman, 1894. Add. 500.
Franklin (Benjamin). FRANKLIN, 1806.
Fraunhofer (Joseph von). BAUERNFEIND, 1884.
Froude (William). FROUDE, 1880.
Ghega (Carlo Cav.). BUZZI, 1879.
Girdlestone (J. W.). Testimonials. GIRDLESTONE, 1889.
Gordon (L. D. B.). CONSTABLE, 1877.
Graham (Gerge). ABBOT (C.), 1842. App. 543; GRAHAM (Geo.), 1792. App. 559.
Graham (Thomas). SMITH (Robert A.), 1884.
Grant (Horace). CHADWICK (Sir E.), 1880, p. 234.
Grattan (T. C.). Secessionist. TRAIN (G. F.), 1862.
Gray (Thomas). WILSON (T.), 1845, '60.
Gresham (Sir Thomas). GRESHAM, 1833; WILSON (Effingham), 1844.

BIOGRAPHIES (SPECIAL)—*continued.*

Grey of Wilton (William, Lord). EGERTON (Sir P. de M. G.), 1847.

Griffith (Julius). GRIFFITH (J.), 1832. App. 559.

Gruner (L.). EGLESTON, 1884.

Guglielmini (D.). GUGLIELMINI, 1719.

Guinand (P. L.). GUINAND, 1825.

Hadley (George). HADLEY, 1835; HADLEY, 1840; RIGAUD (S. P.), 1835.

Hadley (Henry). HADLEY, 1835; HADLEY, 1840; RIGAUD (S. P.), 1835.

Hadley (John). HADLEY (J.), 1835. App. 559; HADLEY (J.), 1840; RIGAUD (S. P.), 1835.

Hagen (G.). HAGEN (G.), 1884.

Hallauer (O.). HIRN (G. A.), 1884.

Hallette (A.). HALLETTE (A.), 1846.

Halley (Edmund). Defence against the charge of Religious Infidelity. RIGAUD (S. J.), 1844. App. 573.

Hanson (W.). His resignation of the Office of Engineer and Architect. Correspondence. SOUTH Australia, 1867, p. 227.

Harriot's (Thomas) Papers. RIGAUD (S. P.), 1831; RIGAUD, 1831, App. 573.

Harrison (John). ABBOTT (C.), 1842. App. 543. Date of birth and death and inscription on his tombstone in Hampstead Churchyard. HARRISON (John), 1800. App. 561.

Hartley (Jesse). Diary. HARTLEY (Jesse).

Hartwich (E. H.). STRECKERT, 1884.

Hatcher (H.). BRITTON, 1847.

Henry (Joseph). Life and Contributions to Science. HENRY, 1872.

—— Memorial. HENRY, 1881.

Herschel (Sir J. F. W.). HERSCHEL, 1872.

Hesse (Otto). BAUER, 1883.

Hirn (G. A.). DWELSHAUVERS-D RY, 1890; FAUDEL and Schwoerer, 1893; HIRN, 1890; SLABY (A.), 1890.

Hobbs (A. C.), in memoriam. DURFEE, 1892.

Holley (A. L.). HOLLEY, 1884.

—— Memorial Statue. DREDGE, 1890.

Hooze (J. A.). HOOZE (J. A.), 1893. Add. 508.

Huddart (Captain Joseph), F.R.S. COTTON (W.), 1855; HUDDART (J.), jun., 1821.

Hull (Commander T. A.). Superintendent of the Charts at the Admiralty. Statement of his case. MARKHAM, 1879.

—— Statement in his vindication. TEMPLE (T. G.), 1880.

Humboldt (Alexander von). DOVE, 1869; MARTIUS, 1860.

BIOGRAPHIES (SPECIAL)—*continued.*

Hume (D.). HUME, 1776.
Huskisson (William). WALKER (James S.), 1831.
Hutton (Dr. J.). PLAYFAIR (J.), 1805.
Janvier (Antide). ABBOTT (C.), 1842. App. 543.
Jeffcock (Parkin). JEFFCOCK, 1867.
Jeffreys (Julius). JEFFREYS, 1855.
Jenkin (Fleeming). JENKIN, 1887.
Jennings (G.). JENNINGS, 1887.
Joule (James Prescott). REYNOLDS (O.), 1892.
Kobell (Franz von). HAUSHOFER, 1884.
Kosciusko (Thaddeus). EVANS (W. W.), 1883
Leblanc, Nicholas. ANASTASI, 1884.
Le Roy (Julien). ABBOTT (C.), 1842. App. 543.
Le Roy (Pierre). ABBOTT (C.), 1842. App. 543.
Lesseps (Ferdinand de). SMITH (George Barnett), 1895. Add. 533. De Lesseps banquet, 1880. LESSEPS. Recollections of 40 years. LESSEPS, 1887. Add. 515.
Lewis (Rev. Thomas), Presentation of a Silver Clock to. LEWIS (Rev. T.), 1836. App. 566.
Locke (Joseph). DEVEY, 1862.
Logan (Sir William E.). HARRINGTON (B. J.), 1883.
Luca (Ferdinando de). CIALDI, 1870.
McAlpine (W. J.). MCALPINE, 1892.
Maclaren (Charles). MACLAREN, 1869.
Manetti (A.) MEINI, 1867.
Marchand (Lucien). Letters on his case. MARCHAND (L.), 1853. App. 567.
Margetts (George). ABBOTT (C.), 1842. App. 543.
Marum (Martin van). QUETELET, 1840.
Maxwell (James Clerk). CAMPBELL (L.), and Garnett.
Merchant (Brevet-Brigadier-General G. S.), U.S.A. CULLUM, 1880.
Meyer (Robert), discoverer of the principles of the conservation of energy. WEYRAUCH, 1890.
Meysey-Thompson (Sir H. S.). MEYSEY-THOMPSON, 1874.
Mitchell (Joseph). Life in the Highlands. MITCHELL (Joseph), 1883–84.
Monge (G.). Services and scientific Work. DUPIN, 1819.
Montluisant (C. L. J. de). MONTLUISANT, 1892.
Moore (Sir John). Burial. AIRY (Sir G. B.), 1871, p. 16.
Morland (Sir S.). Life, writings and inventions. MORLAND, 1838.
Morse (Prof.). JEANS (W. T.), 1887.
Mudge (Thomas). ABBOTT (C.), 1842. App. 543.

BIOGRAPHIES (SPECIAL)—*continued.*

Muir (William). SMILES (R.), 1888, p. 208.
Muirhead (Henry), M.D., LL.D. DYER (H.), 1890.
Murdock (W.). Character and claims. MURDOCK, 1809.
Nägeli (Karl von). GOEBEL.
Napier (Admiral). TEXIER (E.), 1854.
Nasmyth (James). NASMYTH, 1883.
Newton (Sir Isaac). NEWTON, 1796. App. 570; WHEWELL (W.), 1836. Life, writings, and discoveries. BREWSTER, 1855.
Ohm's (G. S.) scientific services. LOMMEL (E.), 1889.
Otto (Dr. Nicolaus August). SLABY (A.), 1890.
Papworth (John P.). Architect to the King of Wurtemburg. PAPWORTH, 1879.
Pasteur (L.). PASTEUR, 1884.
Peabody (George). WALLIS (S. T.), 1890.
Peacock (George), Dean of Ely. PEACOCK (G.) [1858].
Peto (Sir Morton). PETO (Sir S. M.), 1893.
Phillips (E.). COLLIGNON (E.), 1890.
Phipson (W. W.). PHIPSON, 1892.
Pitou-Bressant. PITOU-BRESSANT, 1892.
Plantamour (E.). SMYTH (C. P.), 1883.
Prechtl. Unveiling of bust of Prechtl in the Vienna Technical High School. KOLBE and Berger, 1892.
Priestley (Rev. Joseph), LL.D. PRIESTLEY, 1833. Philosophical character. HENRY (W.), 1832.
Pritchard (E.). A Birmingham Civil Engineer in South Africa. PRITCHARD (E.), 1889.
Pugin (A. N. Welby). FERREY, 1861.
Pugin (Augustus). FERREY, 1861.
Rankine (W. J. M.). RANKINE, 1881.
Redesdale (Lord). As a railway legislator. FRANCE (R. S.), 1867.
Redtenbacher (Ferdinand), founder of Machine Science. KELLER (K.), 1892.
Reis (P.). THOMPSON (S. P.). 1883.
Rennie (John). Obituary notice. DUPIN, 1821.
Rennie (Sir John). RENNIE (Sir J.), 1875.
Rickman (J.). RICKMAN (W. C.), 1841.
Roebuck (John), M.D. ROEBUCK (J.), 1839.
Roentgen (G. M.). BRUECKMANN, 1892.
Ronalds (Sir F.). RONALDS, 1880.
Rumford (Sir Benjamin Thompson, Count). ELLIS (G. E.), 1873; TYNDALL (J.), 1883, p. 335.
St. Vincent (Earl), charges against. JEFFRY, 1806.
Schinkel (C F.). HITTORF, 1857.

BIOGRAPHIES (SPECIAL)—*continued.*

Schmidt (Friedrich). SCHMIDT (F.), 1891.

Schwedler (J. W.), his services as Surveyor of Buildings. SCHWEDLER (J. W.), 1891.

Scott (Sir Walter). BALLANTYNE.

Sella (Quintino). GIORDANO, 1884.

Sheepshanks (Rev. Richard). A reply to the Obituary notice of the Royal Society, and a review of the reply by them. SOUTH (Sir J.), 1856.

Siebold (C. T. v.). HERTWIG, 1886.

Siemens (Werner von). Personal Recollections. SIEMENS (W. von), 1893.

Siemens (Sir Wm.). MAYNARD, 1884; POLE, 1888. Memorial address, Berlin. WEDDING (H.), 1884.

Simons (Pierre). QUETELET, 1884.

Simpson (T.). SIMPSON (T.), 1805, pp. 203, 204.

Smeaton (John). PLATT and Morfill, 1892. Pedigree and Arms, Will and codicil. SMEATON (J.), 1892, 1793, p. 208. Reports made during his career. SMEATON (J.), 1797, 1812, 1837, p. 207.

Smith (Charles Shaler). AMERICAN Society of Civil Engineers, 1887.

Sopwith (Thomas). RICHARDSON (Sir B. W.), 1891. Dinner to him on his retirement from the Agency of the W. B. lead mines in Northumberland and Durham. SOPWITH (T.), 1871, p. 225. A Souvenir on his retirement from Professional Occupations in 1871. SOPWITH (T.), 1871.

Stephenson (George). BOXER (F. N.), 1860; LUCCHESINI, 1869; SMILES (S.), 1857, 1860, 1868. Centenary. STEPHENSON (G.), 1881; STEPHENSON (G. and R.), 1880.

Stephenson (Robert). BOXER (F. N.), 1860; FLACHAT, 1859; JEAFFRESON, 1864; SMILES (S.), 1868. Centenary. STEPHENSON (G. and R.), 1880.

Stephensons, The, and other Railway Pioneers. LAYSON, 1881.

Stevens (Messrs.), of Hoboken, Engineers, Naval Architects, and Philanthropists. THURSTON (R. H.), 1874, p. 310.

Stevenson (R.). STEVENSON (A.), 1851, 1861; STEVENSON (D.), 1878.

Stévin (Simon). QUETELET, 1846.

Stuart (William), engineer of the Plymouth Breakwater. HOPKINS (E.), 1855. Add. 508.

Sully (Henry). ABBOTT (C.), 1842. App. 543.

Taylor (G. L.). Autobiography. TAYLOR (G. L.), 1870–72.

Telford, Thomas. TELFORD (T.), 1838, p. 287. Works. WIEBEKING (C. F. von), 1842. Telford Monument in Westminster Abbey, Various Inscriptions for. TELFORD (T.), 1840, p. 288.

BIOGRAPHIES (SPECIAL)—*continued.*

Thomas (S. G.). MAYNARD, 1885; THOMAS (S. G.), 1891.
Thurston, Robert Lawton, 1800–73. THURSTON (R. L.).
Timur (Moghul Emperor). Autobiography. TIMUR, 1830.
Tompion (Thomas). ABBOTT (C.), 1842. App. 543.
Topley (William), F.R.S. WOODWARD (H. B.), 1894. Add. 539.
Trélat (Émile). Banquet, 1891. TRÉLAT.
Tresca (Henri). Theoretical design of his chief works. ST. VENANT (A. J. C. B. de), 1885. (Scientific works.) TRESCA (H.), 1868, '71.
Trevithick (Richard). Life and inventions. TREVITHICK (F. and R.), 1872, '83.
Tyndall, Professor John. JEANS (W. T.), 1887.
Vaudrey (Émile). ROUSSELLE (H.) and Darcel, 1877.
Vaughan (W.) VAUGHAN (W.), 1839.
Vignoles (C. B.), soldier and civil engineer. VIGNOLES (O. J.), 1889.
Vitruvius. BALDUS, 1612.
Walter (T. U.) WILSON (Joseph M.), 1888.
Watt (James). BARR (A.), 1899; CAXTON, 1852; LARDNER, 1840; Life, 1859. MUIRHEAD; Mechanical Inventions, 1854. MUIRHEAD; SMILES (S.), 1866; WILLIAMSON (G.), 1856; Éloge. ARAGO (F.), 1839.
Washington (George). Monument. WASHINGTON (George), 1884. A reply to Lord Mahon on the mode of editing his writings. SPARKS, (J.), 1852.
Weber (Max Maria von). BERGHAUS, 1881.
Wedgwood (Josiah). METEYARD, 1865.
Wells, (W. C.). WELLS (W. C.), 1818.
Wheatstone (Prof.). JEANS (W. T.), 1887.
Whewell (William), D.D. Life and Correspondence. DOUGLAS (Mrs. S.), 1881.
Whitehurst (J.). Life and Writings. WHITEHURST (J.), 1812. App. 581.
Wicksteed (J. H.). Journal and letters. WICKSTEED (J. H.), 1883.
Wilkinson (J.). Memoranda. WILKINSON (J.).
Williams (R. H.). WILLIAMS (R. H.), 1889.
Winkler (E.). WINKLER (E.), 1888.
Woodcroft (B.). WOODCROFT (B.), 1879.
Woolf (A.). HOCKING, 1875.
Worcester (Marquis of). DIRCKS, 1865, '66; WORCESTER (Marquis of), 1825; WORCESTER (Marquis of), 1825. App. 581.
Wren (Sir Christopher). ELMES (J.), 1823.
Wyatt (John), master carpenter and inventor, 1700–1766. WYATT (J.), 1885.

BIOLOGY. Animals and Plants, Circulation in. PRITCHARD (A.). 1842. New Zealand. Studies for Students, 1881–89. NEW ZEALAND, p. 409,

BIRTHS, DEATHS, AND MARRIAGES.

England. Registrar General's Reports, 1838, etc. Quarterly Returns, 1849, etc. General Abstracts, 1886, etc. Annual Summary of Births and Deaths in London and other great Towns, 1880, etc. Returns of annual average Death Rate, 1879–86. Return of proportion of deaths from small-pox, 1879–86. PARLIAMENTARY..Papers, pp. 466–7.

Ireland. Reports of Registrar General, 1869, etc. IRELAND, p. 140.

Massachusetts. Returns, 1881, &c. MASSACHUSETTS.

Scotland for 1855, etc. SCOTLAND, 1861, p. 174.

See also POPULATION, STATISTICS (Vital).

BITUMEN. *See* ASPHALT.

BLAST FURNACES.

Application of hot air blast. HERDER, 1840.

Blast engines. COULTHARD, 1867; SCHINZ (C.), 1870.

Blast Furnace for the making of Cast Iron. SCHINZ (C.), 1868.

Chemistry of the Blast Furnace. BELL (Sir I. L.), 1869, p. 119.

Construction and conduct of, and Studies on. VATHAIRE (A. de), 1885, 1866.

Crane's patent for the use of Anthracite combined with hot blast in the smelting of iron. CRANE *v.* Price, etc., 1840.

Design and operation. WEDDING (H.), 1888.

Development and appropriation of Heat in Iron Blast Furnaces. BELL (Sir I. L.), 1869, p. 120.

Economy of fuel in the Blast Furnace for smelting iron. BELL (Sir I. L.), 1872, p. 120.

Fuel. Study of coal, coke and charcoal as blast-furnace fuel. THÖRNER, [1884].

Going into blast with Anthracite Furnaces. EGLESTON, 1885.

Graphic Method for calculating Blast Furnace Charges or "Burdens." JENKINS, 1891.

Iron Smelting chemically considered. BELL (Sir I. L.), 1890, p. 120.

—— Chemical Phenomena of. BELL (Sir I. L.), 1872, p. 119.

—— Sum of Heat utilised in smelting Ironstone, Cleveland. BELL (Sir I. L.), 1875, p. 120.

—— India. Operations at Dechouree. INDIA, p. 121.

—— Neilson and others *v.* Baird and Co. Trial for infringement of a patent. NEILSON, 1843.

BLAST FURNACES—*continued.*

Iron Smelting. Relative properties of Iron in the smelting furnace. HARTOP (H.), 1843.

—— Waste of heat in smelting Iron Ores. BELL (Sir I. L.), 1894, p. 121.

Phenomena. GRUNER (L.), 1873.

Regeneration of blast-furnace gases. EHRENWERTH (J. von), 1883.

Slag of the composition of gehlenite. BAUERMAN, 1886.

Sweden. AHRENBERG, 1864.

United States. FOURNEL, 1840.

—— Blast Furnace practice in. COLQUHOUN (W.), 1891.

Warm-Blast Steam Boiler Furnace. HADLEY (J. C.), 1886.

Use of Caustic Lime in the. BELL (Sir I. L.), 1875, p. 120.

Washing of waste gases from blast furnaces. EHRENWERTH (F. von), 1885.

BLASTING.

By means of Compressed Air. GARFORTH, 1879.

Explosive Compounds, Machine Rock-drills and Blasting. DRINKER, 1883.

Gunpowder blasting of Chalk rock. FRASER (T.), 1864.

Handbook. GUTTMANN, 1892.

Rock Blasting. ANDRÉ (G. G.), 1878.

BLASTING UNDER WATER. PASLEY, 1836.

In rivers with rapid currents. FARQUHAR (F. U.), 1879. Add. 500.

Ahuriri Bluff, Napier, construction of the breakwater. GOODALL, 1886.

Boston Harbour submarine blasting, removal of Tower and Corwin Rocks. FOSTER (J. G.), 1869.

Glasgow, Blasting under water the Bridge substructure. SOOYSMITH (C.), 1879.

Hell Gate explosion near New York, and so-called Rackarock and Panclastite. SPRENGEL (H.), 1886.

Holyhead, Large Blast at. ROBERTSON (G.), 1859.

Hoosac Tunnel, use of Tri-nitro-glycerin. MOWBRAY, 1872.

New York Harbour. Destruction of Flood Rock. ABBOT (H. L.), 1885.

Severn, gunpowder, use in blasting marl rocks in the River. EDWARDS (G.), 1845.

BLEACHING.

Bleaching of Cotton. ASHWORTH (1861).

BLIND.

Instruction. PENNSYLVANIAN Institution, 1845.

BLOWING MACHINES. DENY, 1887.

BLOWPIPE ANALYSIS. Manual. CORNWALL, 1882.
Blowpipe in Chemistry, Mineralogy and Geology. ROSS (Lt.-Col. W. A.), 1884.
Manual of Qualitative Blowpipe Analysis and Determinative Mineralogy. ELDERHORST, 1881.
Mouth Blowpipe, Its use. SCHEERER (S.) and Blanford, 1875.
Use of Blowpipe in Chemical Analysis. BERZELIUS, 1822.
Use in the qualitative and quantitative examinations of ores, &c. PLATTNER and Muspratt, 1854.
Vademecum. SMITH (Aquilla), 1862.

BOATS (SUBMARINE). HOVGAARD, 1887.

BOATMEN, Porters and Carters. Jersey Regulations. JERSEY, 1846.

BOGS, Ireland. Act for draining and allotting Bogs, 1830. IRELAND, p. 140.
Reports of Commissioners, 1810–19. IRELAND, p. 140.

BOILERS. *See* MARINE ENGINES AND BOILERS, STEAM BOILERS.

BOOKBINDING. BEVAN (G. P.), Industries, vol. 8.

BOOK-KEEPING according to the English, Italian and Scotch systems of single and double entry. LEWIS, 1870.
Commercial Book-keeping and Phraseology in four languages. HADDON (1879).
English system of Book-keeping by single or double entry. JONES (E. T.), 1796.

BORING AND BORING APPARATUS.
Machine for drilling tunnels, etc., in mines. PENRICE (H. N.) [1881 ?]
Sinking of Shafts, driving of Tunnels and Galleries, and all other constructions in water-bearing ground and quicksand, etc., by using the freezing method. POETSCH (F. H.), 1889; POETSCH, 1888. Add. 528.
Specification of Apparatus for Boring Rocks. JONES (J. T.), and Wild, 1882.
Specification of Apparatus for Sub-aqueous Boring. ENGLISH (Thomas), 1889.
Bletchley Boring. THOMPSON (Beeby), 1890. Occurrence of Granite. JUKES-BROWNE, 1889.
Böhmisch-Brod, Deep Boring near. RZIHA, [1875].
Clifton Estate. BROWN (J. M.), 1881.

BORING AND BORING APPARATUS—*continued.*

London. Crossness Pumping Station. Report of the Engineer on the Boring Operations at. LONDON, 1869. Add. 516.

Teignmouth, Devon, Notes on Deep Borings at the waterworks and in the Trias at. ORMEROD (G. W.), 1888. Add. 524.

BOTANY. Absorption of Metallic Oxides by Plants. PHILLIPS (F. C.), 1882.

Anatomical Method. RADLKOFER, 1883.

Anatomy of Plants and Vegetable economy. MONCEAU (D. du), 1758.

Dendrology: facts, etc., proving that trees and vegetables derive their nutriment independently of the earth. WALLIS (J.), 1835.

Dictionary of the Vegetable Kingdom. LINDLEY and Moore, 1889.

Floration of plants. QUETELET, 1841.

Floscularia coronetta, a new species. CUBITT (C.), 1869.

Flowers, Grasses and Shrubs. PIRIE, 1870.

Forms of Seedlings. LUBBOCK, 1886.

New Commercial Plants and Drugs. CHRISTY (T.) and Vétillart, 1882.

Orchids (Conference of Royal Horticultural Society). ROYAL Horticultural Soc., 1886.

Phænogamous and Vascular Cryptogamous plants collected in Dakota and Montana. CHICKERING, 1878.

Vegetable Physiology, Apparatus relating to. VINES (S. H.), 1878.

Australia. Flora. MUELLER, 1882; WOOLLS (W.), 1867.

—— Orchids. FITZGERALD (R. D.), 1877.

Britain. Arboretum et Fruticetum Britannicum; or, trees and shrubs of Britain. LOUDON, 1844.

—— Hertfordshire. HOPKINSON (J.), F.L.S., 1887.

Dakota Group. LESQUEREUX, 1891.

India. Forest flora of North-west and Central India. BRANDIS and Stewart, 1874.

Kew Gardens. KEW Gardens, 1878.

Liverpool. DICKINSON (J.), 1851.

New Zealand. Indigenous Grasses. BUCHANAN (J.), 1880; NEW ZEALAND, 1886, p. 409.

—— North island of New Zealand. COLENSO, 1865.

BOUNDARIES.

Municipal Corporation Boundaries Commission. Reports, 1832, 1837. PARLIAMENTARY..Papers, p. 468.

Ireland. Report relative to proposed boundaries of Cities and Boroughs, 1832. IRELAND, p. 140.

BRAKES.

Automatic Screw Brake. SMITH (Walter P.), 1880.
Hydraulic Brakes theory. CANET, 1879.
Indicator and Prony Brake. THURSTON (R. H.), 1890, p. 309.
Laycock's Patent Brake. LAYCOCK, 1888.
Prony Brake (large). Construction. THURSTON (R. H.), 1886, p. 308.
Self-acting Brakes. GUÉRIN. PIOBERT, Combes, and Couche, 1857.
Soulerin Continuous Brakes. SOULERIN (L.), 1890, 1892.
Steel-McInnes' patent pneumatic reaction brake. STEEL (James) and McInnes, 1875.
Vacuum Brakes. SMITH'S Vacuum Brake Co., 1878.
See also RAILWAYS (Brakes).

BRASS. BEVAN (G. P.), Industries, vol. 1.
Brass Founder's Guide. LARKIN (J.), 1869.
Metallurgy of Brass, etc. PERCY (J.), 1861.

BREAD. BEVAN (G. P.), Industries, vol. 12.
Bread-making. New apparatus for panification, of M. Rolland, baker. PONCELET, etc., 1840.

BREAKWATERS. BENTHAM, 1844.
Advantages of employing a Framework of Malleable Iron in the construction of Breakwaters. VETCH (J.), 1841.
Construction of. BOSSUT and Viallet, 1790; NOEL, 1781; QUINETTE DE ROCHEMONT, 1893; SHELLSHEAR (W.), 1886.
Construction of small Breakwaters and the silting they give rise to. FARREN, 1889.
Construction of, for harbours similarly situated as one at Dover. BURN (C.), 1859.
Floating Breakwaters. CAMBRIELIN, 1887. TIMONOFF (V. E. de), 1892. Improvements in. CLARK (E. H.), 1884.
—— Moored floating constructions as breakwaters. Navigation of rivers and seaports improved by them. WHITE (John), 1840.
—— New Floating Breakwater. McCOSH, 1874.
Iron Breakwaters. WEBB (E. B.), 1862.
Plan for a fixed Breakwater or fortified Harbour of refuge. JOHNSTON (J.), 1844.
Protection of beds of rivers and of seas. CHAUBART, 1870.
Report of Select Committee, 1860. PARLIAMENTARY..Papers, p. 480.
Aberdeen South Breakwater. Report, 1885. MESSENT.
Brixham, in Torbay. Plan. RENDEL (J. M.), 1836.
Byron Bay, N.S.W. Proposed Breakwater. BYRON Bay, 1890.
Cherbourg completion. BONNIN (J.), 1857.

BREAKWATERS—*continued.*

Cherbourg. Compared with Plymouth breakwater. CACHIN, 1820

Colombo Breakwater, 1872–81. INDIA, p. 117.

Copenhagen. Construction of a Breakwater at the Free port. MÖLLER (H. C. V.), 1893.

Glenelg Pier, South Australia. Wrought iron louvred breakwater. HAYS (W. B.), 1856.

Greenway Breakwater. THOMAS (E. C. G.), 1880.

India. Construction (Harbour Works at Kurrachee and Madras). PARKES (W.), 1880.

Italy. Recent Breakwaters and Sea Defences in Italy. LUIGGI, 1893; LUIGGI, 1894. Add. 517.

Middelgrunden Fort in the Sound. Breakwater and Port. HANSEN (P.), 1893.

New Zealand. Napier. Specification of Works. NAPIER, N.Z., 1886.

Pendeen, Cornwall. Proposed Harbour and Breakwater. JOHNSTON (T. M. H.), 1854.

Plymouth. Account. RENNIE (Sir J.), 1848. Breakwater now constructing. RENNIE (J.) and Whidbey, 1806. Bentham's Minute. PLYMOUTH Sound, 1812. Report, 1812. MOYLE, 1813. Proposed fort behind breakwater. PLYMOUTH, 1862.

Portland. Report. BUSH, 1836.

—— Breakwater for Portland Roads as projected. HARVEY (J.), 1827.

—— Breakwater and Harbour of Refuge to be constructed in Portland Roads. PARLBY, 1847.

—— Isle of Portland. PORTLAND, 1847.

—— Bill for constructing a breakwater. PORTLAND, 1825.

Table Bay. Papers relating to the proposed construction of a breakwater. Statement of expenditure incurred in its construction. TABLE BAY, 1852, 1864.

Tasmania. Emu Bay. EMU BAY, 1890.

Timaru, New Zealand, Breakwater. Specification of Contract No. 4 for. TIMARU, N.Z., 1881.

—— Report as to the damage caused by building a breakwater at, and the further damage that may accrue therefrom. TIMARU, N.Z., 1880.

Tyne. Conditions, Specifications, Form of Tender, Correspondence, etc., for the construction of breakwaters at or near the entrance to. TYNE River, 1854, 1855, pp. 335, 336.

Vardö Harbour. Sections of Breakwaters. VARDÖ, 1894.

BREWERIES.

Breweries and Maltings. SCAMELL (G.), 1880.

Brewing and distilling. BEVAN (G. P.), Industries, vol. 12.

BRICKLAYERS AND BRICKLAYING.

Employment of Brickwork and Masonry in building construction. BURN (R. S.), 1876.
Information for Bricklayers. BUCKLE, 1886.
London Prices of Bricklayers' Materials and Work. LANGLEY (B.), 1750.
Observations on Brick-bond. ANONYMOUS, 1884, p. 50.
Practical Bricklaying. ANONYMOUS (1830).
Rudiments of Practical Bricklaying. HAMMOND, A., 1885.
Treatise on Bricklaying, Culling, and Setting. WALKER (F.), 1885.
Tiles, Pipes, etc. LEJEUNE, 1870.

BRICKS AND BRICKMAKING.

Bricks and Brickmaking. ANONYMOUS, 1878, p. 41; CHAMBERLAIN (Humphrey), 1857.
Bricks with a high amount of chalk. HARTIG, 1893.
Experiments on the mode of binding brick construction. BRUNEL (Sir M. I.), 1836.
Manufacture of Bricks and Tiles. DOBSON, 1850, 1873, 1882.
Manufacture of Bricks, Tiles, Terra Cotta, etc. DAVIS (C. T.), 1884.
Allahabad. FALCONNET, 1874.
Blechingley Tunnel. Brickmaking. SIMMS (F. W.), 1843.
England. COX (S. F.), 1881.
India (Western), Brickmaking in. Chemical and Geological Observations relating to. WALSH (M.), 1869.
India. Machines, two brickmaking, sent out to India in 1851, with remarks on brickmaking by machinery. Report. STERLING (R. S.), 1858.
Montana, Manufacture of Bricks (Slag) in. EGLESTON, 1891.
Sydney, Bricks and Brickmaking in and around. NANGLE (J.), 1894. Add. 522.

BRIDGES (GENERAL REFERENCES). GAUTIER, 1728; TAUNTON (J. H.), 1881; THOMASON Civil Engineering Coll., 1862–4; WILKINS (H. St. C.), 1879.
Application of Iron to the construction of Bridges. CAMPIN, 1883.
Average plans of Bridges. HART (J. H. E.), 1868.
Battle of the Bridges. ANONYMOUS, 1882, p. 41.
Blowing-up of Bridges. BURGOYNE (Sir J. F.), 1868.
Bridge Architecture. Advantages of the flying pendent lever bridge. POPE (T.), 1811.
Bridge and roof construction. LANGER (J.), 1873.
Bridge and Tunnel Centres. M'MASTER, 1875.
Bridge-building. Treatise—equilibrium of vaults and arches. CRESY, 1839.

BRIDGES (GENERAL REFERENCES)—*continued.*

Bridge-building. BARKHAUSEN, Nessenius and Houselle, 1892; BAUERNFEIND, 1876; CROIZETTE-DESNOYERS, 1885; HEVSINGER von Waldegg, 1877, 1883. Add. 507; LAISSLE, 1871–76; LEUPOLD, 1726; MARY (L. C.), 1873; WALTER (J.), 1766; WHIPPLE (S.), 1873; WINKLER (E.), 1875–87.

Bridges constructed by Nicholas Zabaglia. ZABAGLIA and Fontana, 1743.

Cantilever system. GAUDARD, 1891.

Cementitious Architecture as applicable to the construction of bridges. WHITE (John), 1832.

Collection of photographs. ANONYMOUS, p. 41.

Combination Bridges, their merits and cost, a comparison with Howe truss bridges. STROBEL (C. L.), 1882.

Construction of. GAUTHEY, 1809; JENKIN, 1876; MORANDIERE (R.), 1874, 1880–88; SCOTTI (F.), 1828; WIEBEKING (C. F. von), 1810. Construction and design of the wing-walls of Bridges. MARTIN (T.), 1863.

Continuous Revolving Drawbridges. HERSCHEL (C.), 1875.

Curved bridges. GRAEFF, 1867; NÖRDLING, 1869.

Design of Bridge for public road constructed on 60-feet well foundation in a sandy soil. TWIDDALE (C. H. A.), 1876.

Design of Movable Bridges. FINDLAY (C. F.), 1881.

Evolution in the construction of great bridges. GAUDARD, 1892.

Examples of Bridges and Viaducts. HASKOLL, 1867.

Graphical method for the analysis of Bridge Trusses. GREENE (C. E.), 1875.

Great heights. BARRÉS du Molard, 1827.

Highway Bridges. Specifications. BOUSCAREN, 1887, 1890. Economy in. WADDELL (J. A. L.), 1883, '87, '89.

Iron Highway and Railway Bridges. ANONYMOUS, 1885, p. 46.

Iron, stone, timber, and wire, and suspension Bridges. Theory, practice, and architecture of. WEALE (J.), 1839–43.

Metal, stone, and wood. BOUDSOT, 1853.

Modern Bridges. HEINZERLING, 1873–76.

Modern Examples of Road and Railway Bridges. MAW and Dredge, 1872.

Oblique Bridges. BUCK (G. W.), 1839, 1880. Application of masonry to their construction. DOBSON, 1842.

Observations on Bridge building. ANONYMOUS, 1760, p. 50.

Patent for Invention in the art of constructing. JORDAN (James), 1797.

Pine stringers and floor beams for. BATES, 1890.

Pins or Rivets in Bridges. ENDE, 1891.

Practice and Architecture. HOSKING, 1843.

Principles. HUTTON (C.), 1801.

BRIDGES (GENERAL REFERENCES)—*continued.*

Properties of continuous bridges. BENDER (C. B.), 1876.
Proportions of Pine used in. BENDER (C. B.), 1873.
Remarks on the different constructions of Bridges. MARQUAND, 1749.
Specification. GUPPY, 1856.
Strains on Braced Iron Arches and Arched Iron Bridges. HEAFORD, 1883.
Strength of Bridges. SHREVE (S. H.), 1877; TETMAJER, 1875.
Theory and Calculations of Continuous Bridges. MERRIMAN, 1876.
Theory of Bridge Construction. HAUPT (H.), 1856; WOOD (D. N.), 1876.
Theory of strains for the calculation and construction of Bridges. DIEDRICHS, 1871.
Tracts on Bridges and Vaults. WARE (S.), 1822.
Treatise on Bracing. BOW, 1851.
Use of wells for foundations. ABBOTT (F.), 1850.
Various engravings relating to. ANONYMOUS, p. 41.
Water flowing through Bridges. HAVERSTADT (C.), 1883.
See also VIADUCTS.

BRIDGES OF BOATS.

Punjab, 1887. INDIA, p. 129.
—— Boat bridge over the River Ravi at Chichawatni. LALL (K.), 1879.
—— Permanent bridge of boats across the River Ravi, 1892. INDIA, p. 130.

BRIDGES (IRON).

Iron Bridges. COLLIGNON, 1888; EBERT, 1886; HEINZERLING, 1870; MATHESON, 1873, '77; MAYNARD, 1868; REGNAULD, 1870; RÉSAL (J.), 1885–89.
—— Arched Iron Bridges. DUPUY, 1879.
Calculations and theory of Iron Bridges and roofs. RITTER (A.), 1879.
Cast and wrought iron Bridge construction. HUMBER, 1861.
Cast Iron Bridges. MARCELLIS and Duval, 1840.
—— New system of casting. POLONCEAU (A. R.), 1839.
Chain and other iron Bridges. ANONYMOUS, p. 42.
Comparative study of various systems. GAUDARD, 1865.
Construction of Bridges in Iron and Steel. FIDLER, 1887, '93.
Construction of Iron Bridges. BELELUBSKY, 1888; KLEIN (H. J.), 1886; WINKLER (E.), 1884.
Construction of Iron Highway Bridges. BOLLER, 1876.

BRIDGES (IRON)—*continued.*

Continuous girder bridges. BARKHAUSEN (G.), [1892].
BONOLIS (A.), 1878, '81.

Cylinder Bridge Piers. Calculations necessary in designing them.
NEWMAN (J.), 1875.

Cylinder Bridge Piers and the Well System of Foundations.
NEWMAN (J.), 1893.

Designing of ordinary Iron Highway Bridges.
WADDELL (J. A. L.), 1884.

Girders. Cast and wrought iron Bridges and girders.
HUMBER, 1857.

—— Comparison of the various forms of Girder Bridge.
MYERS, 1876.

—— Girder Bridges design. Some points for the consideration of English engineers. SHELFORD (W.) and Shield, 1886.

—— Girder making and the practice of Bridge building in wrought iron. HUTCHINSON (E.), 1879.

—— Mechanics of the Girder. CREHORE, 1886.

Highway Bridges of Iron and Steel. General Specifications.
WADDELL (J. A. L.), 1887, '88, '89.

Iron Wire. SEGUIN (Aîné), 1826.

Lattice Bridge. Iron superstructure. Type for five railways.
BELELUBSKY, 1881.

Lattice and plate girders. WÖHLER (A.), 1850.

M'Callum's Inflexible Arched Truss Bridge. M'CALLUM, 1859.

Metal Bridges. BIADEGO, 1886; BONNIN (R.), 1875; PASCAL, 1887; CHICCHI, 1886; Construction. MOLINOS and Pronnier, 1857.

—— Principles of economy in the design of metallic bridges.
BENDER (C. B.), 1885.

Road covering. PESTALOZZI, 1876.

Skeleton Structures. Steel and Iron Bridges. HENRICI, 1866.

Spans (Great). RUPPERT.

Specifications for strength of Iron Bridges.
WILSON (Joseph M.), 1886.

Tubular Bridges. YVERT (L.), 1851.

Tubular Girder Bridges. FAIRBAIRN (Sir W.), 1851, p. 402.

Tubular and other Iron Girder Bridges. DEMPSEY, 1865, 1877.

Tubular Bridges. Original and Useful Formulæ applied to.
TATE (T.), 1850.

—— Strains in the interior of Tubular Bridges.
AIRY (Sir G. B.), 1862, p. 21.

Warping. GAUDARD, 1893.

Wöhler's experiments, value of, for dimensioning iron constructions, especially bridges. MOHR (O.), [1881].

BRIDGES (IRON)—*continued.*
Wrought Iron Bridges. LENTZ, 1865; UNWIN (W. C.), 1869, p. 360.
—— Construction of Wrought Iron Bridges. LATHAM (J. H.), 1858.
—— Lectures on Construction. UNWIN (W. C.), 1872.
—— Bridge Members, their strength. ROBINSON (S. W.), 1882.
—— Practical Formulæ and rules for finding the strain and breaking weight. DOWLING, 1866.
—— Modern Wrought Iron Bridge. Russian Engineers' Report. RUSSIA, 1852.
—— Use of wrought and cast iron (system of Cadiat and Oudry). ANONYMOUS, 1851, p. 50.
—— Use of sheet iron, wrought iron, and cast iron. CADIAT and Oudry.
See also GIRDERS.

BRIDGES (MILITARY). REYMOND (L. von), 1881.
Bridges (Military), principles and construction of. DOUGLAS (Sir H.), 1816, 1853.
—— United States. HAUPT (H.), 1864.
—— By United States Army and those adopted by the great European Powers and in British India. CULLUM, 1869.
—— Creusot. HENNEBERT, 1890.
Military Pontoons. ANONYMOUS, 1835, p. 49.

BRIDGES (RAILWAY). POZZI, 1887. Add 529.
Bridges to carry a single line of Railway over an occupation road. ANONYMOUS, p. 41.
Chain Bridges. LEBLANC, 1844.
Channel Bridge. Anglo-French Railway Bridge, and how it is to be constructed. STEAD (H.), 1865.
—— British Channel Bridge. VILLEMONT (J. H.), 1894.
—— Reports. SCHNEIDER and Co. and Hersent, 1889.
—— Channel Bridge and Railway Company. CHANNEL, 1890–92.
—— Marine Viaduct, or Continental Railway Bridge between England and France. BOYD (C.), 1857.
Iron. Huesca to Francia by Canfranc. FAQUINETO and Puig de la Bellasca, 1893. Add. 500.
Iron Truss Bridges for Railroads. Methods of Calculating Strains. MERRILL, 1870.
Long Span Railway Bridges. BAKER (Sir B.), 1873.
Movable Bridges. CONRAD (F. W.), 1848.
Railway Bridges of long and short span. ROEBLING (J. A.), 1869.

BRIDGES (RAILWAY)—*continued.*

Railway Bridges. Masonry Abutment. PASSOS, 1892.

—— For turnpike, public, and occupation roads. Estimates. GROVER (J. W.), 1866, '70.

Small span cross beams. ANDERSON (W.), 1866

Specifications for Iron and Steel Railroad Bridges and Viaducts. COOPER (Theodore), 1889.

Steel and Iron Railway Bridges, General Specifications for, for spans up to 300 feet. CANADA, 1892. Add. 490.

Structural Steel for Modern Railroad Bridges. G. H. Thomson's Standard Specifications. THOMSON (G. H.), 1894. Add. 536.

BRIDGES (STONE).

Bridges (Stone). DEGRAND, 1856; DUBOSQUE, 1881, '87; DUPUIT, 1854.

—— Architecture of Stone Bridges. RIOU (S.), 1760.

BRIDGES (SUSPENSION). BOUDSOT, 1853; BRIX (A. F. W.), 1887 DREWRY, 1832; ELLET (C.), jun., 1843; NAVIER, 1823.

American. CLERICETTI, 1878.

Chains and Wire as applied to Suspension Bridges. Brief Inquiry into the comparative value of. WEST (W.), 1835.

Construction of Suspension Bridges. BARLOW (P.), 1837, 1851; SWEND, 1887.

Dredge's improved system. GOODWYN, 1843. Dredge's patent taper principle Suspension Bridges. YOUNG (C. D.) 1851.

Economy in Suspension Bridges. YOUNG (E. W.), 1873.

Improved Suspension Bridge. COWPER, 1847.

Iron Suspension Bridges. Lectures. BOILEAU (A. H. E.), 1842. Practical Essay. THOMSON (John), Capt., 1839.

Mathematical theory. GILBERT (D.), 1826.

Properties of the Catenarian Curve. GILBERT (D.), 1821.

Size of Pins for connecting flat links in the chains. FOX (Sir C.), 1865.

Steel Rope Suspension Foot Bridge over River, 200 feet span by 6 feet wide. Design for. HARPER (L.), 1894. Add. 505.

Stiffness, of any desired degree of. BENDER (C. B.), 1881.

Suspension Bridges, and bar iron and iron wire for these bridges, compared with notes on some bridges of antiquity. STEWART (W.), 1855.

Suspension Chain Bridges with an improved method of forming the supporting chains or rods. SEAWARD (J.), 1823.

Table for facilitating computations. GILBERT (D.), 1831.

Theory and practice in the construction. GOODWYN (H.), 1854.

Dunkirk. PLOCQ, 1859.

BRIDGES (SWING).
Movable Swing. Pollet. ALEXANDRE, 1891.
Swing Bridge over the River Wensum at Norwich. BIDDER (G. P.), 1846.

BRIDGES (WOODEN). WINKLER (E.), 1881, '87.
Collection of Designs. LALL (K.), 1860.

BRIDGES (PARTICULAR).
Albert Bridge, Chelsea. ALBERT Bridge, 1879.
Albert and Battersea Bridges. Arbitration. ALBERT Bridge, 1879.
Alton, Illinois. Specifications for Superstructure of Railway Bridge across Mississippi River at. MORISON (G. S.), 1892. Add 521.
American Bridge Disasters. Cause and remedy. VOSE (G. L.), 1887.
American Railroad Bridges. COOPER (Theodore), 1889.
America (North). Comparison of American and European Systems. COMOLLI, 1879, '83.
Andé on the Seine. Construction of a temporary (wooden) foot-bridge at. BONNIN (R.), 1873.
Ardennes Canal, Montrejean, la Roche-de-Glun, Petit Vey and Souillac Bridges. SARTORIS (U.), 1823.
Argentine (Central). Railway Specifications for Bridge Work CENTRAL Argentine Railway, 1869.
Ashtabula Bridge. Report of the Committee on the disaster, 1877. ASHTABULA BRIDGE.
Australia (South). PORT BRIDGE, 1877.
Austria. K.k. Staatsbahn Stanislau-Woronienka. Arched bridges. HUSS, 1893.
Austria. Strengthening Iron bridges. HUSS, 1889.
Batraki. Bridge over the Volga, near. BUZZI, 1887.
Belfast. Proposed permanent bridge in lieu of Albert Bridge. BRETLAND and Bazalgette, 1886.
Bezwada, India. Railway Bridge over the Krishna River at. INDIA, p. 121.
—— Krishna Bridge. Estimate and Accounts. SPRING (F. J. E.), 1893.
Bismarck Bridge, Northern Pacific Railroad. MORISON (G. S.), 1884. Specifications for the substructure and superstructure, 1883. NORTHERN Pacific Railroad.
Blackfriars Bridge. Experience of a new bridge. BLACKFRIARS, 1756. Inscription in City Latin. BIRCH (B.), 1760. Act. BLACKFRIARS, 1765. Plan for redeeming the Toll, 1767. LONDON Bridge. Petition, 1774. MYLNE (R.). Reports. BLACKFRIARS, 1833, 1840. Specification of Repairs. BLACKFRIARS, 1833. Report. WALKER (James) and Burges, 1833.

BRIDGES (PARTICULAR)—*continued.*

Blackfriars Bridge. Reports respecting a new Bridge. BLACKFRIARS, 1861, 1862.

—— Contract for removal of existing bridge and for building new bridge. CUBITT (J.) and Carr, 1869.

Blair Crossing Bridge. MORISON (G. S.), 1886.

Bombay. Designs for large Railway bridges. DOWDEN, 1876.

—— Designs for iron bridges for deep rivers in alluvial formations with reference to bridges on the Bombay Railway. DOWDEN, 1876.

Bordeaux. BORDEAUX, 1822. Designs for metal bridge over the Garonne at Bordeaux. LA ROCHE TOLAY and Regnauld, 1860; REGNAULD, 1869.

Bow Bridge. Old bridge at Stratford-le-Bow. BURGES, 1837. Report on the widening. WALKER (James), 1829, p. 395. Report and estimates. WALKER (James), 1832, p. 393.

—— Mode of construction. REDMAN (J. B.), 1839.

Boyne Bridge. History. MACNEILL, 1860. History and state in 1858–59. BOYNE BRIDGE.

Britannia Tubular Bridge. BRITANNIA, 1849; CLARK (E.), 1851, 1881. Tourists' Guide. JACKSON (T.), 1850.

—— Practicability of erecting a tubular bridge. STEPHENSON (R.), Fairbairn and Hodgkinson, 1846.

Britannia and Conway Bridges. AIRY (Sir G. B.) 1872, p. 17; DEMPSEY, 1865, 1877; FAIRBAIRN (T.), 1849.

—— Construction. FAIRBAIRN (Sir W.), 1840, p. 401.

Brooklyn. *See below,* New York and Brooklyn.

Buda-Pesth. Suspension Bridge across the Danube, uniting Pesth with Buda. CLARK (W. T.), 1852–53.

Burmah. Contracts for Ironwork for Railway Bridges, 1887. INDIA, p. 114.

Cairo Bridge, Illinois. FISH, 1892; MORISON (G. S.), 1892.

Calcutta Steam ferry-bridge crossing the river. HENDERSON and Greaves, 1854.

Canterbury, New Zealand, Timber Bridges. CANTERBURY, N.Z.

Chaudiere Bridge over the Ottawa River, tender for iron superstructure over. CHAUDIERE Bridge, 1880.

Chelsea Bridge, strength of. CHELSEA Bridge, 1860–62. Construction. PAGE (G. G.), 1863.

Chenab Bridge at Sher Shah, Punjab, 1888–90. INDIA, p. 130.

Chicago. Howe Truss Bridge. CHICAGO, 1891.

—— New Rush Street Bridge. ARTINGSTALL, 1884.

Chitpore, Lattice Girder Bridge, to replace Suspension Bridge at. HANDLEY (H. J.), 1817.

Christianshavn Knippelsbro, new bridge at. LÜDERS [1872].

BRIDGES (PARTICULAR)—*continued.*

Italy. Collection of Laws relating to Bridges and Common Roads, 1860–83. ITALY, p. 146.

—— Reports of the General Direction of Bridges and Roads, 1872. ITALY, p. 146.

Japan, Imperial Railways of. Bridges. JAPAN, 1891.

—— Iron Railroad Bridges, System for. WADDELL (J. A. L.), 1886.

—— River Crossing and Bridge Piers. OTAGAWA, 1888.

Jerry's Plains, New South Wales, Bridge over the Hunter River. HUNTER River, 1890.

Kansas City Bridge. CHANUTE and Morison, 1870.

Kehl, Bridge over the Rhine at. Foundations, etc. VUIGNER (E.), 1862; VUIGNER (E.) and St. Denis, 1861.

Kew Bridge. Bill for building a stone bridge from the parish of Ealing to the hamlet of Kew, 1782. KEW Bridge.

Keystone Bridge Company. Examples of Structures built by the Company. KEYSTONE Bridge Co.

—— Album of iron bridges, roofs, columns, chords, links, etc. KEYSTONE Bridge Co., 1874.

Lagan (New) Bridge. Specification and contract drawings, 1888. BELFAST.

Lambeth Bridge Co. *v.* Metropolitan Board of Works. LAMBETH, 1878.

Lanark and Dumbarton Bridge, Act for making, 1820. LANARK.

Liverpool. Proposed High-level Roadway Bridge across the Mersey. WEBSTER (J. J.) and Wood, 1893.

—— Calculations of an inflexible iron bridge: a beam bridge 600 ft. span uniting the arched and suspension systems. STEWART (W.), 1861.

Liverpool and Birkenhead, practicability of connecting by wire suspension bridge of one span. BARLOW (P. W.), 1860.

London Bridge. CARR (H.), 1871; DOUGLAS (Sir H.), 1816, 1853; TYRRELL (C.) and Anderson, 1823. Probable consequences of the demolition of London Bridge. ENGLEFIELD, 1821.

—— Nature of the Tides and fall of Water at London Bridge. LANGLEY (B.), 1737.

—— London Bridge, Observations. SILLS (J.), 1873.

—— London Bridge, Observations on its rebuilding. SEAWARD (J.), 1824.

—— History, 1758. Chronicles, 1827. LONDON Bridge.

—— Plan for discharging the debt due to the Artificers of London Bridge, 1767. LONDON Bridge.

—— Report respecting the enlargement and improvement of the waterway under London Bridge, 1814. LONDON Bridge.

BRIDGES (PARTICULAR)—*continued.*

Forth Bridge. Proposed Chain Bridge over Firth of Forth at Queensferry. ANDERSON, J., 1818.
—— Proposed Forth Bridge. STEPHENSON (G. R.) and Tone, 1862.
France. FRANCE, 1834, 1870, p. 435.
—— Roads and Bridges. REYNAULD (L.), 1883.
—— French Bridges. WATSON (William), Ph.D., of Boston, 1892.
—— Bridges of Neuilli, of Mantes, of Orléans and of Louis XVI. PERRONET, 1788.
Fribourg. Bridges over the Saane. SAANE, 1866.
—— Suspension Bridge, Switzerland; historical and technical description. FRIBOURG, 1839.
Fulham Bridge, 1758. LONDON Bridge.
Geneva Suspension Bridge. DUFOUR, 1824.
Germany. Iron Truss Bridges. KLETT.
Glasgow Bridge. Substructure. Blasting under water. SOOYSMITH (C.), 1879.
Graz, Albrechts Bridge over the Mur. GABRIELY, 1887.
—— Ferdinands Bridge. GABRIELY and Winter, 1882.
Grey Gorge Bridge, New Zealand. Report on accident to the bridge, 1876. NEW ZEALAND, p. 408.
Hamburg. Street Bridges over the North Elbe. GLEIM and Engel, 1890.
Hamilton, bridge over the River Clyde, near. CLYDE, 1770.
Hammersmith, proposed Bridge over River Thames. HAMMERSMITH BRIDGE, 1824.
Hampton Court Bridge, 1758. LONDON Bridge.
Harlem River Bridge, Plans. HARLEM, 1886.
Harper's Ferry. Iron suspension and trussed bridge, designed for the Baltimore and Ohio Railroad Company. BOLLMAN, 1852.
Hawkesbury Bridge, New South Wales, opening May 1, 1889. HAWKESBURY, 1889.
Hayling (South) Bridge Company. Proposed bridge over the Langstone Channel between Hayling Island and Southsea. HAYLING Island, 1883.
Holland, Movable bridges for the railways of. CONRAD, (F. W.), [1848].
Hooghly "resultant tension" principle. GOODWYN, 1854.
—— East Indian Railway Bridge at Hugli. LUARD (C. H.), 1887.
Hutcheson Town Bridge at Glasgow. Maintenance. PAGE (J.), 1865.
Illinois and St. Louis Bridge Company Reports. EADS, 1868–70.
Indian Rivers, Bridges over. ABBOTT (F.), 1850.
Indus, N. W. Railway Bridge over the. ROBERTSON (F. E.), 1889.

BRIDGES (PARTICULAR)—*continued.*

Italy. Collection of Laws relating to Bridges and Common Roads, 1860–83. ITALY, p. 146.

—— Reports of the General Direction of Bridges and Roads, 1872. ITALY, p. 146.

Japan, Imperial Railways of. Bridges. JAPAN, 1891.

—— Iron Railroad Bridges, System for. WADDELL (J. A. L.), 1886.

—— River Crossing and Bridge Piers. OTAGAWA, 1888.

Jerry's Plains, New South Wales, Bridge over the Hunter River. HUNTER River, 1890.

Kansas City Bridge. CHANUTE and Morison, 1870.

Kehl, Bridge over the Rhine at. Foundations, etc. VUIGNER (E.), 1862; VUIGNER (E.) and St. Denis, 1861.

Kew Bridge. Bill for building a stone bridge from the parish of Ealing to the hamlet of Kew, 1782. KEW Bridge.

Keystone Bridge Company. Examples of Structures built by the Company. KEYSTONE Bridge Co.

—— Album of iron bridges, roofs, columns, chords, links, etc. KEYSTONE Bridge Co., 1874.

Lagan (New) Bridge. Specification and contract drawings, 1888. BELFAST.

Lambeth Bridge Co. *v.* Metropolitan Board of Works. LAMBETH, 1878.

Lanark and Dumbarton Bridge, Act for making, 1820. LANARK.

Liverpool. Proposed High-level Roadway Bridge across the Mersey. WEBSTER (J. J.) and Wood, 1893.

—— Calculations of an inflexible iron bridge: a beam bridge 600 ft. span uniting the arched and suspension systems. STEWART (W.), 1861.

Liverpool and Birkenhead, practicability of connecting by wire suspension bridge of one span. BARLOW (P. W.), 1860.

London Bridge. CARR (H.), 1871; DOUGLAS (Sir H.), 1816, 1853; TYRRELL (C.) and Anderson, 1823. Probable consequences of the demolition of London Bridge. ENGLEFIELD, 1821.

—— Nature of the Tides and fall of Water at London Bridge. LANGLEY (B.), 1737.

—— London Bridge, Observations. SILLS (J.), 1873.

—— London Bridge, Observations on its rebuilding. SEAWARD (J.), 1824.

—— History, 1758. Chronicles, 1827. LONDON Bridge.

—— Plan for discharging the debt due to the Artificers of London Bridge, 1767. LONDON Bridge.

—— Report respecting the enlargement and improvement of the waterway under London Bridge, 1814. LONDON Bridge.

BRIDGES (PARTICULAR)—*continued.*

London Bridge. Historical account. HAWKSMOOR, 1736.
—— Relief of, and its approaches. PALMER (F. I.), 1877.
—— Professional survey of the old and new London Bridges, 1831. LONDON Bridge.
—— Acts, 1822–39. LONDON Bridge.
—— London Bridge Approaches Bill, 1829. LONDON Bridge.
—— Abstract of proceedings and evidence, 1819. LONDON Bridge.
—— Conduct of the Corporation in respect to designs for rebuilding London Bridge, 1823. LONDON Bridge.
—— Minutes of evidence, 1821, '29. LONDON Bridge.
—— Objections to several clauses in the new Bill, 1823. LONDON Bridge.
—— Report of T. Telford on the effects which will be produced on the Thames by the rebuilding, 1823. LONDON Bridge.
—— Report on Bridge House Estates, 1823. LONDON Bridge.
—— Reports on the rebuilding of London Bridge, 1827–29, 1831–56. LONDON Bridge.
—— Report on London Bridge Bill, 1879. LONDON Bridge.
—— Report of the effects which will be produced on the Thames by its rebuilding. TELFORD (T.), 1823, p. 287.
—— Report on widening. JONES (Sir Horace) and Gregory, 1875.
—— Shall it be widened or shall a new bridge be built near the Tower? WEBB (E. B.) and Bolland, 1878.
—— Old and new. COOKE (E. W.) and Rennie, 1833.
—— Old London Bridge. Present state and need of new bridge. DODD, 1820.
London, Port of. An account of the intended Iron Bridge. TELFORD (T.) and Douglass, 1802.
—— Are more bridges needed? BENNOCH, 1853; REDMAN (J. B.), 1878.
—— Metropolitan Communications and Thames Bridges. HALL (E.), 1857.
—— Metropolitan Toll Bridges Act, 1877. Report, 1877. Opening of the bridges free of toll. LONDON, p. 254.
—— Select Committee on Metropolitan Bridges. LONDON, p. 254.
—— Metropolitan Bridges, repairs urgently needed. BAZALGETTE (Sir J. W.), 1880.
—— Proposed new bridge over the Thames, and a new route between the south and east of London. LANCHESTER, 1878.
—— Bridges over the Thames at London. WALMISLEY (A. T.), 1880.

BRIDGES (PARTICULAR)—*continued.*

London, Port of. Thames Toll Bridges, Report on the freeing of the. THAMES, River, 1876, p. 291.

—— Bridge from Westminster to Lambeth. PRICE (J.), 1735.

—— Report relative to the Approaches to the New London Bridge. RENNIE (Sir J.), 1827.

Londonderry. Proposed new bridge. CUBITT (Sir W.) and Barlow, 1857.

Louisville Bridge Company. Reports, 1872. LOUISVILLE Bridge Co.

Lowestoft Ravine Bridge. LOWESTOFT, 1887.

Lucerne. Built in 1869–70. GAUDARD.

Marienburg, over the Nogat. LENTZE, 1855.

Mainz, Bridge over the Rhine at. Report on inspection. FIJNJE (J. G. W.) and Diesen, 1862.

Memphis, Tennessee, Bridge across the Mississippi. Specifications for superstructure (Kansas City and Memphis Railway and Bridge Co.). MORISON (G. S.), 1890.

Menai Iron Suspension Bridge. CUMMING (T. G.), 1824.

Menai Bridge. Proposed bridges over the Menai and the Conway. MENAI Bridge, 1802.

—— Plan for timber bridge over the Menai, 1786. Application for Act, 1817. Opposition to Bill, 1817. MENAI Bridge.

—— Holyhead Road and Menai Bridge Reports, 1821. MENAI Bridge.

—— Papers relating to building a bridge over the Menai Strait, 1819. MENAI Bridge.

Menai Suspension Bridge. PRING, 1829; PROVIS, 1828. Report. TELFORD (T.), 1821, p. 287. Description, 1826; cost, repairs, 1886; Report on condition, 1890. MENAI Bridge.

—— Proposed bridge. HOLYHEAD Harbour, 1844.

—— *See above*, Britannia Bridge.

Merchants' Bridge Terminal Railway Viaduct at St. Louis, Mo. MOORE (R.), 1894. Add. 521.

Mersey, Proposals for a bridge across. ELLACOTT (J.), 1863. Add. 498.

Middlesex Bridges, Report of Magistrates, 1826. MIDDLESEX.

Mirimachi Railway Bridges, Canada. General plans and elevations. INTERCOLONIAL Ry., 1870. Add. 510.

Mississippi River, between St. Paul and St. Louis. Report on bridging. WARREN (G. K.), 1878.

Missouri Valley and Blair Railway and Bridge Company. Specifications for Superstructure of Bridge over the Missouri River, 1882. MISSOURI Valley.

Mönchenstein Bridge catastrophe. RITTER (W.), 1893. RITTER (W.) and Tetmajer, 1891.

BRIDGES (PARTICULAR)—*continued.*

Mönchenstein Bridge catastrophe. Causes of breaking. GAUDARD, 1891.

—— Report on the failure of. TETMAJER, [1893].

Montreal, Railway Bridge over the St. Lawrence at. BATEMAN (F.), 1882; KENNEDY (J.), 1882; SERRELL (W.), 1852. Report on a Survey. KEEFER (T. C.), 1893. Add. 513. Report of proposed works. MONTREAL, 1883. Tender and General Specifications. ST. LAWRENCE Bridge, 1885.

Montrose. Proposed Iron Suspension Bridge over the river South Esk. BUCHANAN (G.), 1824; BROWN (Sir S.), 1824.

—— Present state of the wood bridge. BUCHANAN (G.), 1824.

Morawa Bridge by Ljubitschewo fall. TETMAJER, 1893.

Morphett Street Railway Bridge. ADELAIDE, 1882.

Murray Bridge. Cost. MURRAY River, 1878.

Murray and Port Bridges. Report. MURRAY River, 1877.

Nebraska City Bridge. MORISON (G. S.), 1893.

Nene. Proposed Bridge over the River to form a direct communication between Norfolk and Lincolnshire. RENNIE (J.), 1819.

Netherlands. Great bridges on the railways. BUYS and Kock, 1885.

Newcastle-upon-Tyne. Projected Suspension Bridge, 1825. NEWCASTLE-upon-Tyne. High level Bridge. HODGSON (R.), 1858.

New South Wales. Proposed bridge to connect Bullock Island with the mainland at Newcastle. BULLOCK Island, 1890.

—— Iron Railway Bridges, 1886. NEW SOUTH WALES, p. 403.

New York and Brooklyn Bridge. Practicability of connecting New York and Brooklyn by wire suspension bridge of one span. BARLOW (P. W.), 1860.

—— Prices of Materials and estimated Cost (East River Bridge). NEW YORK and Brooklyn.

—— Report on plans for the Bridge, 1869. NEW YORK and Brooklyn.

—— Reports on proposed East River Bridge, 1867, '70. NEW YORK and Brooklyn.

—— Cost of the Structure and Land (East River Bridge), 1873. NEW YORK and Brooklyn.

—— Communications by the President of the Trustees of the Bridge, 1876. NEW YORK and Brooklyn

—— Reports of the New York Bridge Company, 1872–77. NEW YORK and Brooklyn.

—— Reports and Specifications relating to the East River Bridge, 1869–78. NEW YORK and Brooklyn.

—— Report on the wire used in the construction of the cables for it. RONALDSON (C. E.), 1878.

BRIDGES (PARTICULAR)—*continued.*

—— Steam Transit over the Bridge, 1878.
NEW YORK and Brooklyn.

—— Testimony taken by the Committee of Commerce and Navigation, 1879. NEW YORK and Brooklyn.

—— Report on contracts for steel work, 1882.
NEW YORK and Brooklyn.

—— Report on strength of Cables and suspended superstructure, 1882. NEW YORK and Brooklyn.

—— Report of Trustees, 1885. NEW YORK and Brooklyn.

New York and Brooklyn Bridge. Report on Terminal facilities, 1891. NEW YORK and Brooklyn.

—— Enlargement of Traffic, facilities for.
WELLINGTON (A. M.), 1890.

—— Plans of the Rapid Transit Cable Company.
BRYSON (A.), 1890.

—— *See above*, East River Bridge.

New York Central and Hudson River Railroad. (Form of Specification for superstructure of Iron Bridges.)
NEW YORK Central and Hudson River Rly., 1894. Add. 523.

—— Bridge across the Hudson River. HUDSON, 1891.

New York and New Jersey Bridge. Report of Board of Engineers.
NEW YORK and New Jersey Bridge, 1894. Add. 523.

New York, Lake Erie and Western Railroad Bridges General Specifications, 1879. NEW YORK, Lake Erie.

Niagara. International Bridge over the Niagara River, near Fort Erie. GZOWSKI, 1873.

—— Report on the renewal of Suspension Bridge.
BUCK (L. L.), 1881.

—— Niagara Falls and Clifton, Ontario, Suspension Bridge.
BARLOW (P. W.), 1860; KEEFER (S.), 1869; ROEBLING (W. A.), 1860, 1877; WASSELL (E.), 1876.

Norfolk County and Public Bridges, and Fords, and Bridge Statutes. BRERETON, 1881.

Oka Bridge by Alexin. BELELUBSKY, 1882.

Omaha Bridge (New). MORISON (G. S.), 1889.

Oporto. Bridge Luiz I. SEYRIG, 1886.

Ormond Bridge, Dublin, Plans for rebuilding.
SEMPLE (G.), 1776, 1780.

Oude and Rohilkund Railway. Strength of the Cylinders.
BELL (W.), 1872.

—— Bridge over the Ganges at Benares. Specification of steel superstructure. BATHO, 1881.

Paris. Bridge over the Seine, opposite the Jardin du Roi, 1814.
PARIS. p. 460.

—— —— of the École Militaire. LAMANDÉ, 1814.

BRIDGES (PARTICULAR)—*continued.*

Paris. Carrousel Bridge. POLONCEAU (A. R.), 1839.

Parramatta. Railway Bridges on duplicated line between Parramatta and Penrith, N.S.W. PARRAMATTA, 1888.

Patrick Bridge. Design and Construction. LINDSAY (C. C.), 1878.

Penshaw, new Bridge over the Wear. BALFOUR (D.), 1891.

Philadelphia, Pennsylvania Railroad Bridge over Thirtieth Street. WILSON (Joseph M.), 1870.

Phœnixville Bridge Works. Designs. CLARKE (T. C.), &c., 1873.

Plattsmouth Bridge. MORISON (G. S.), 1882.

Pont-y-tu-Pridd over the River Tâfe. SMITH (Thomas M.), 1846; SNELL (G.), 1846.

Portland, Oregon, Bridge across the Willamette River. Specifications for superstructure (Northern Pacific Railway). MORISON (G. S.), 1883.

Portland Road Bridge near Norwood Junction (London, Brighton and South Coast Railway). Accident, May 1, 1891. PORTLAND Road Bridge.

Portugal. Metal bridges. PORTUGAL, 1872.

Quebec, bridge over the St. Lawrence. LIGHT, 1884.

—— Railway Suspension Bridge over the St. Lawrence near Quebec. SORREL (W.), 1852.

Queensland. Report of the Government Architect and Engineer for Bridges, 1893. QUEENSLAND. Add. 529.

—— Tenders for Ironwork for the bridges on the Gympie Railway. GYMPIE, 1878.

Quincy, Ill. Iron Railway Bridge across the Mississippi river at. CLARKE (T. C.), 1869.

Rakaia Bridge, New Zealand. Report. NEW ZEALAND, p. 408.

Ranowa Bridge by Rjaschk. BELELUBSKY, 1882.

Rhenen, over the Rhine. TELDERS.

Rialto Bridge, Venice. RONDELET (A.). 1836.

Richmond Bridge. Act for building it, 1773. RICHMOND, Surrey.

Richmond Footbridge, proposed. GROVER (J. W.), 1890.

Rochester Bridge. Statutes. ROCHESTER Bridge, 1783. Report on its present state. ROCHESTER Bridge, 1820.

—— New bridge across the Medway. Pneumatic method adopted in constructing the foundations. HUGHES (J.), 1850.

Rouen. Stone Bridge over the Seine. LAMANDÉ, 1815.

Rulo Bridge. MORISON (G. S.), 1890.

Runcorn Bridge. DUMBELL, 1813, 1826. Report. TELFORD (T.), 1817, p. 287. Sketch and Estimates of Machinery used in constructing. TELFORD (T.), 1817, p. 288.

Rush Street Bridge, Chicago. CHICAGO, 1884.

BRIDGES (PARTICULAR)—*continued.*

Russia, Iron Bridges in. BELELUBSKY (N.), 1894. Add. 484.
St. Gothard. VERARD de Ste Anne, 1882.
St. Louis. Proposed Railway Bridge across the Mississippi at. ST. LOUIS, 1867. History. WOODWARD (C. M.), 1881.
Santa Trinita Bridge over the Arno at Florence. VULLIAMY (L.), 1822.
Saugor, Central India. Iron Suspension Bridge over the Beosi River. PRESGRAVE, 1840.
Save near Brod, Railway Bridge over the, 1878–79. BECK von Nordenau and Juda.
Schwedler Bridge. MYERS, 1876.
Scotland. Bill for maintaining certain Bridges in the Highlands, and reports. SCOTLAND, 1803–21, p. 175.
Sculcoates Bridge, Hull. Plans and Sections. HULL, 1872.
Severn Bridge Railway Bill. Minutes of evidence, 1872. SEVERN (River).
Severn Bridge at Lydney. KEELING, 1876–79.
—— Acts for building bridges at Benthall, Bewdley, Cressage, etc., over the Severn, 1776, '95, '99. SEVERN (River).
—— Projected bridge over it, at the Old or Aust Passage, 1845. SEVERN (River).
Shields (North and South). Projected patent wrought-iron suspension bridge across the River Tyne. CHAPMAN (W.), 1825, p. 242.
Sibley Bridge. CHANUTE, Wallace, and Breithaupt, 1889.
Sioux City Bridge. MORISON (G. S.), 1891.
Sukkur, Bridge over the Indus at. ROBERTSON (F. E.), 1885. Theory of the braced arch, with application to the proposed bridge. CUNNINGHAM (A.), 1878.
Swiss and Swedish Bridges. Notes. GAUDARD (J.), 1894. Add. 502.
Sydney. Spit, Middle Harbour, Proposed bridge at. SYDNEY, 1889, p. 272.
Taptee Bridge at Surat. Survey and borings, 1871. INDIA, p. 132.
Tarban Creek, New South Wales, Report on the proposed Bridge over. TARBAN Creek, 1890.
Tay Bridge. Report on an Inspection. TAY Bridge, 1878.
—— History and construction. GROTHE, 1878.
Tay Bridge Casualty. AIRY (Sir G. B.), 1880, p. 17. Appendix to Report and Evidence. TAY Bridge, 1880. Report upon the circumstances attending the fall of a portion. TAY Bridge, 1880.
—— Inquiry, Elevations and Sections, and Report. TAY Bridge, 1880.

BRIDGES (PARTICULAR)—*continued.*

Tay Bridge Casualty. Circular letter from the Board of Trade to the Railway Companies, and minute upon Hutchinson's observations on the Report of the Court of Enquiry.
TAY Bridge, 1880.

—— Tay Bridge Bill. Reports, Minutes, etc.
TAY Bridge, 1880, '81.

—— Guide and Photographs. TAY Bridge, 1887.

—— New Tay Bridge. BARLOW (C.), 1889. Seismometric measurements of the vibration during the passing of Railway trains. EWING, 1888.

Thames River Bridge and Approaches at New London, Connecticut (New York, Providence and Boston Railroad). BOLLER, 1890.

Torrington and Marland Light Railway. Photographs of the bridges.
TORRINGTON and Marland Light Railway, 1882. Add. 536.

Tours. Machines, tools, &c., used in the construction of arches in mortar. BEAUDEMOULIN, 1841.

Tower Bridge. Proposed bridge over the Thames below London Bridge. ANONYMOUS (1878), p. 57; BAZALGETTE (Sir J. W.), 1878; BARRY (J. W.), 1894. Add 483; ORDISH and Matheson, 1885.

—— Bridge unnecessary. BARLOW (P. W.), 1878.

—— Tower High Level Bridge Metropolis Bill, 1879. Evidence, etc. Act, 1885. TOWER Bridge.

—— Summary of Master's Log. TOWER Bridge, 1894.

—— Its history and construction. TUIT (J. E.), 1894; WELCH (C.), 1894. Add. 538.

Trent Bridge. Old and New. TARBOTTON (M. O.), 1871.

Trezzo, on the Adda. SAVIGLIANO, 1887.

Tyne Bridge. Reports. MYLNE (R.), 1772; SMEATON (J.), and Wooler, 1772.

Tyrol (South). Street Bridge over the Noceshluck by St. Giustana. GABRIELY, 1889.

Uvod River, reconstruction of bridge over. Superstructure of the Parabolic system. BELELUBSKY, 1884.

Vichy Bridge, constructed in 1868–70. LA FOSSE, 1873.

Victoria Bridges, Returns. VICTORIA, 1851–61, p. 378.

Victoria Bridge, Montreal. Handbook. BOXER (F. N.), 1860.

—— Construction. HODGES (J.), 1860.

—— Cheapest mode of bridging the St. Lawrence at Montreal.
M'CALMONT, 1856.

Victoria Bridge over Brisbane River. Plans, etc.
BRISBANE, 1893. Add. 487.

Vienna. Erection of a bridge over the Danube, near Vienna.
WHITE (W. Howard), 1874.

BRIDGES (PARTICULAR)—*continued.*

Vienna. Carl Bridge. MITIS, 1829.

—— Sophia Bridge. MITIS, 1826.

Walton-on-Thames. Acts for building a bridge across the Thames from Walton-on-Thames to Shepperton.
WALTON-on-THAMES, 1747, '80.

Walton-on-Trent. Act for building a bridge over the Trent from Walton-on-Trent to Barton under Needwood.
WALTON-upon-Trent, 1833.

Washington Bridge over the Harlem River, New York.
HUTTON (W. R.), 1890.

Wellington Bridge over the River Aire at Leeds. Account of the building. TIMPERLEY (J)., 1844.

Westminster Bridge. Acts, 1736, '38, '42. WESTMINSTER Bridge.

—— Description. LABELYE, 1751.

—— Methods of laying the foundations. LABELYE, 1739.

—— Design for the Bridge at New Palace Yard, composed of nine arches. LANGLEY, 1736.

—— Survey of Westminster Bridge, now sinking into ruin.
LANGLEY, 1748.

—— Westminster Bridge 1758. LONDON Bridge.

—— Reports of Select Committee. Minutes of Evidence. Correspondence, tenders, Reports, etc.
WESTMINSTER Bridge, 1743–1857.

—— Proposed new bridge. HAWKSMOOR, 1736; GADSDON, 1739.

—— Review of schemes. JAMES (J.), 1736.

—— Reply to John James's Review of schemes for building this bridge. LANGLEY (B.), 1737.

—— Scheme for raising £60,000 to build a bridge after the manner of that at Thoulouse.
WESTMINSTER Bridge, 1740. Add. 539.

—— Present state. BROWN (Sir S.), 1836.

—— Report. WALKER (James), 1837, p. 394.

—— Report on the New Westminster Bridge.
RENDEL (J. M.) and SIMPSON, 1856.

Yarmouth (Great) Haven Bridge and Navigation Improvement. Specification, 1849. GREAT Yarmouth.

RIDGE PIERS. Use of wrought iron and concrete columns for the construction of. DIXON (J.), 1875.

BRINE PUMPING. Compensation for subsidence Bill. Report of Select Committee, 1891. PARLIAMENTARY. Papers, p. 468.

BRONZE.

Manganese Bronze as a material for Steamship Propellers. ANONYMOUS, 1883, p. 50.

Memoir on the art of gilding bronze. ARCET (J. d'), 1818. App. 545.

Phosphor Bronze Notes. RUOLZ-MONTCHAL and Fontenay, 1878.

BUILDERS' PRICE BOOKS. ANONYMOUS, 1792, p. 41; ANONYMOUS, 1825, p. 52; BURNELL, 1861; LAXTON (W.), 1839, &c.; LOCKWOOD (C.), 1888, &c.

Contractor's and Surveyor's Pocket Table Book. SCRIBNER (J. M.), 1878.

Württemberg Building Trade Price Lists. WURTEMBERG, 1873.

BUILDING.

BREYMANN, 1854–57; HUCK, 1871; REBOLLEDO, 1875, '89.

American House Carpenter. HATFIELD, 1868.

Ancient Lights and evidence of Surveyors thereon. KERR (R.), 1868. Law and Science. COX (H.), 1869.

Application of acoustics to the construction of Buildings. BARRETT (W. F.), 1869.

Architect, Engineer, and Operative Builder's Constructive Manual. DAVY (C.), 1839.

Art. BRUYÈRE, 1823–28; PRUD'HOMME (L.), 1870

Bombay Builder. PERIODICAL PUBLICATIONS, p. 12.

Builder. PERIODICAL PUBLICATIONS, p. 12.

Builder's Assistant, 1738. Builder's Chest-Book, 1739. Builder's and Workman's Treasury of Designs, 1740. Builder's Director, 1763. LANGLEY (B.). Builder's Jewel, 1768. LANGLEY (B. and T.).

Builder's work and Building Trades. SEDDON (Col. H. C.), 1886.

Building of houses proof against fire and vermin. CAUTY, 1775.

Building of Town Houses. EDIS, 1884.

Building in or on Water. CHIOLICH-LOWENSBERG, 1864–65.

Building News and Engineering Journal. PERIODICAL PUBLICATIONS, p. 12.

Building World. PERIODICAL PUBLICATIONS, p. 12.

Civil Constructions. DEVILLEZ, 1878; MŒRMAN, 1876.

Clerk of the Works. HOSKINS, 1878.

Concrete Buildings. DRAKE (C.), 1874. Add. 497.

Construction. BURN (R. S.), 1874, 1876; THIERRY (X.), 1843. Notes for Science and Art Department Examinations. ANONYMOUS, 1879–91, p. 49. Key to Science and Art Department Examinations. ADAMS (H.), 1894. Add. 479. Practical. ALLEN (J. P.), 1893. Construction of Buildings. THOMASON Civil Engineering Coll., 1862–64.

Design of Structures. ANGLIN, S., 1891.

BUILDING—*continued.*

Designs for Public and Private Buildings. SOANE (J.), 1828.
Dictionary. MOTHES, 1863; PIJTAK, 1851.
Elements of Practical Construction. Structures in direct tension and compression. DOWNING, 1875.
English Gentleman's House. KERR (R.), 1865.
Equilibrium of Structures. WARR (G. F.), 1851.
Erection of dwelling-houses. BROOKS (S. H.), 1868.
Examples of Building Construction. LAXTON (H.), 1857–60.
Formulas used in construction. BERG (L. de C.), 1890–92.
Foundation of Buildings. BURESCH, 1867.
Furniture, Plate, etc., of Old English Mansions. RICHARDSON (C. J.), 1841.
Graphical determination of forces in engineering structures. CHALMERS (J. B.), 1881.
Habitations of Man in all Ages. VIOLLET LE DUC, 1876.
Immigrant Builder, or hints to handy men. DWYER, 1872.
Iron. Building in iron and other metals. KLASEN (L.), 1876.
—— Designing wrought- and cast-iron structures. ADAMS (H.), 1883.
—— Notes on Iron Constructions. ROMAND (A.), 1842.
—— Iron and iron constructions. MEHRTENS, 1887.
—— Iron and Steel Buildings. RÉSAL (J.), 1892.
—— Iron Structures for home and abroad. YOUNG (C. D.), 1870.
Joints made and used by Builders. CHRISTY (W. J.), 1882.
Lascelles' System of Concrete House-Building. LASCELLES, 1888.
Law of Building and Engineering Contracts. HUDSON (A. A.), 1891; LEPAGE, 1847.
Laws. ANONYMOUS, p. 48.
Leases and Building Contracts, Law relating to. EMDEN, 1882, 1885.
Lectures on Building. STORM-BUYSING, 1854–57.
Liverpool. Building Regulations. GOLDSTRAW, 1882.
London, Act for regulation of Buildings and Party-Walls, and for preventing mischiefs by Fire, 1807. PARLIAMENTARY..Papers, p. 468.
—— Acts regulating the Buildings. BUILDERS' Society, 1856.
—— Metropolitan Management and Building Acts (Amendment) Act, 1882. EMDEN.
—— Metropolitan Buildings Act, 1855. LAXTON (F. W.), 1855; LONDON, p. 254; PIPER, 1856.
—— Building Acts Amendment Act, 1878. LONDON, p. 254.
—— Building Acts Amendment Bill. LONDON, 1890, p. 254.
—— Improvement, principally about the Court, 1816. LONDON, p. 254.

BUILDING—*continued.*

London Metropolitan Improvements, 1816, 1857. LONDON, pp. 254, 255.
—— Public Offices and Buildings, 1877. LONDON, p. 255.
—— Metropolitan Buildings and Management Bill. Report of Select Committee, 1874. LONDON, p. 255.
—— Select Committee on improving the Metropolis. Reports, 1836–41. LONDON, p. 254.
—— Commission for improving the Metropolis. Seven Reports, 1844–50. LONDON, p. 254.
—— Metropolitan Street Improvement, 1877. LONDON, p. 254.
—— Building Act, 1894. CRAIES (W. F.). Add. 494.
—— Bill to restrict the height of buildings. 1888. LONDON, p. 254.
—— Streets and Building Bill, 1894. Report from Select Committee on. LONDON. Add. 516.
Machinery. HEVSINGER von Waldegg, 1877, 1883. Add. 507.
Master Masons to the Crown of Scotland and their Works. MYLNE (R. S.), 1893.
Measurer's Jewel. LANGLEY (B.), 1742.
Mechanics. CASALONGA, 1874; TETMAJER, 1889; WENCK, 1870.
Modern Domestic Building Construction. ROBSON (G.), 1876.
New and Improved Practical Builder. NICHOLSON (P.), 1837.
Notes on Building. ANONYMOUS, 1852. Add. 481; ANONYMOUS, 1856, p. 49.
Open Structures. Cases of Instability. SANG (E.), 1887.
Origin of Building. WOOD (John), 1741.
Patent Method of constructing Buildings and Walls. HITCH, 1828.
Plant for transporting materials for the erection of high buildings. PROELL, and Scharowsky, 1885.
Portable Buildings. BIELEFELD, 1853.
Practical Guides. NICHOLSON (J.), 1830; PERNOT (L. J.), 1868.
Proper regulation of buildings in towns. HOSKING, 1848.
Public Buildings. Acoustics of. SMITH (Thomas R.), 1861.
—— Index to Reports, 1807–33. Estimates, 1845. Reports of the Public Works Loan Board, 1876. PARLIAMENTARY..Papers, p. 498.
Public Offices Accommodation Commission. TREVELYAN, 1867.
Rudiments of the Art of Building. DOBSON, 1877.
Science of Building. A treatise on the principles of Construction. TARN (E. W.), 1870, '82.
Shoring and its application. BLAGROVE, 1887.
Shoring and Underpinning and generally dealing with ruinous and dangerous structures. STOCK (C. H.), 1882.

BUILDING—*continued.*

Specifications of Works, with rules, formulas, and tables. LALL (K.), 1886.
Stability and Statics. MÜLLER-BRESLAU, 1886.
Stability of Constructions. Theory. SCHEFFLER (H.), 1864.
Staircases and Hand-rails. NICHOLSON (P.), 1835.
Statistics. ELB, 1882.
Structures in an Earthquake Country. PERRY (Prof. J.) and AYRTON (W. E.), 1878.
Supervision of Private Building by public authority. ELLICE-CLARK, 1883.
Theory and Practice of Modern Framed Structures. JOHNSON (J. B.), Bryan and Turneaure, 1893.
Theory of framed structures. MOHR (O.), 1885.
Theory of Structures. BOVEY, 1893.
Timber Houses of the 15th and 16th Centuries, Rouen, Caen, Beauvais, Gisors, Abbeville, Strasbourg. PUGIN (A. W.), 1836.
Timber Importer's and Builder's Standard Guide, GRANDY, 1865.
Trade (Building) Construction, etc. Notes. SEDDON (Col. H. C.), 1873.
Transverse strains and its application in the construction of buildings. HATFIELD, 1877.

BUILDING MATERIALS. PARDO, 1885, '91; THOMASON Civil Engineering Coll., 1862; WIEBE (F. K. H.), 1858. Catechism. HAUENSCHILD and Olschewski. 1879–80. Chemistry. ABNEY, 1888.
Decay and preservation of Building Materials. ANSTED, D. T., 1860.
Lectures. DENNY, 1868–78; DENT, 1887.
Otago and South New Zealand. BLAIR (W. N.), 1879.
Physics and Chemistry. GOTTGETREU, 1880.
Technology of Building materials employed in the art of building. CHATEAU, 1863–66.
United States Building Materials. STEVENSON (D.), 1841.
Wood: its use as a constructive material. STEVENSON (W.), 1894.
See also MATERIALS OF CONSTRUCTION; STRENGTH OF MATERIALS.

BUILDING SOCIETIES.

Benefit Building Societies. Treatise. STONE (W.), 1851.
Instructions for the establishment of. ANONYMOUS, 1838.

BUILDINGS (PARTICULAR).

Antwerp. Tower of the Church of Notre Dame. SERRURE, 1840.
Beauvais Cathedral. History and description. GILBERT, 1829.
Belgium and France. Iron construction of building above ground. COUTAG, 1889.

BUILDINGS (PARTICULAR)—*continued.*

Bristol Cathedral. History. LEVERSAGE, 1853.

Cambridge Corn Exchange. Report of proceedings on the occasion of laying the foundation stone. CAMBRIDGE, 1874. Add. 490.

Cape Colony. Report of the Chief Inspector for 1864. CAPE Colony, p. 220.

Christchurch, N.Z. Government Buildings. CHRISTCHURCH, N.Z., 1875.

Cooch Behar Palace. Detailed drawings, 1882. INDIA, p. 117.

Crystal Palace. Evidence before the Court of Inquiry. FULLER, (F.), 1875. Restoration of prosperity and utility. FULLER (F.), 1875.

Drexel Building, 1888. PHILADELPHIA, p. 33.

Edinburgh. Reports as to who was the architect of Heriot's Hospital. RITCHIE (R.), 1855–56.

—— Regent's Bridge and new gaol, laying foundation stones. EDINBURGH, 1815.

Ely Cathedral. MILLERS, 1834.

England. Plans, Elevations and Sections of Buildings executed in Norfolk, Suffolk, Yorkshire, Staffordshire, Warwickshire, Herts, etc. SOANE (J.), 1788.

—— Public Buildings in the West of England. FOULSTON, 1838.

Genoa, Il Palazzo di San Giorgio, demolition or preservation. GENOA, 1889.

Germany. GERMANY, 1851, '55.

—— Mainz, Speier, Worms Cathedrals. MEYER-SCHWARTAU, 1893. Add. 520.

India. Lahore Central Jail. LALL (K)., 1868.

—— New Telegraph Office for Lahore. LALL (K.), 1881.

—— Proposed Medical School for Lahore. LALL (K.), 1878.

—— Lawrence and Montgomery Halls, India. LALL (K.), 1877.

—— Mayo Schools of Art at Lahore. LALL (K.), 1883.

—— New Jail at Montgomery. LALL (K.), 1875.

—— Nizamut Palace of Moorshedabad. INDIA, p. 126.

—— Old Public Buildings of Mahomedan Architecture at Beejapoor, 1857. INDIA, p. 130.

—— Public Office Buildings and Clerks' Cottages at Simla, 1889. INDIA, p. 131.

Liverpool. St. George's Hall. RAWLINSON, 1871.

London. Critical Observations on the buildings and improvements of London, 1771. LONDON, p. 254.

—— Metropolitan Improvements, or London in the 19th Century. SHEPHERD (T. H.), 1827.

—— Public Buildings of London. PUGIN and Britton, 1838.

—— Public offices and Metropolitan Improvements. HOPE (A. J. B. B.), 1857.

BUILDINGS (PARTICULAR)—*continued.*

London. Albert Hall. Opening proceedings. ALBERT Hall, 1871.
—— British Museum Reading Room. HOSKING, 1858.
—— Law Courts, Block Plans. STREET (G. E.), 1869.
—— Newgate. Rebuilding the gaol, 1767. LONDON Bridge.
—— Royal Exchange, ANGELL (S.), 1838. Repairing, 1767. LONDON Bridge. Rebuilding. HOPPER, 1839. Description. WILSON (Effingham), 1844.
—— Royal Mint, working and operations. ANONYMOUS, 1870, p. 59.
—— Royal Palace and Street (Proposed). TRENCH (Sir F. W.), 1846.
—— St. George's Cathedral, Southwark. Description. ST. GEORGE'S Cathedral, 1851.
—— St. Paul's Cathedral. History. DUGDALE, 1716.
—— Westminster. Collegiate Chapel of St. Stephen, Westminster. Architectural Antiquities. MACKENZIE, 1844.
—— Government Offices. Remarks on designs proposed for, especially on those for the block plans and the approaches to the New Palace at Westminster. WESTMINSTER Palace, 1857.
—— Houses of Parliament. Who was the Art Architect? PUGIN (E. W.), 1867; BARRY (A.), 1868. Rebuilding. HOPPER (T.), 1837. Drainage. SHONE (I.), 1887.
—— —— Site of the contemplated Houses of Parliament. ANONYMOUS, 1835, p. 50.
—— —— House of Commons Accommodation Report. COMMONS (House of), 1894. Add. 493.
—— Westminster Abbey Gleanings. SCOTT (G. G.), 1861.
—— Westminster Hall Restoration. Report of select committee on. WESTMINSTER Hall, 1885.
—— Westminster Palace. BRAYLEY and Britton, 1836. Report of the decay of the stone of. WESTMINSTER Palace, 1861.
—— —— Palace at Westminster. Who was the Art Architect? BARRY (Rev. A.), 1868.
—— —— Mechanical scaffolding used at. BARRY (C.), jun.
—— New Law Courts and National Gallery competitions. Barry and Street. BARRY (E. M.) 1872.
—— Whitehall. Admiralty Buildings Extension. Letter from the R. Inst. of B. A. against the scheme. ROYAL Inst. of British Architects, 1880, p. 140.
—— Site of the new Admiralty and War Offices, Whitehall. ROBINS (E. C.), 1886.
Middleham, Documents relating to the Church of. ATTHILL, 1847.
Milan. Church of San Lorenzo. KOHTE, 1890.

BUILDINGS (PARTICULAR)—*continued.*

New York Capitol. Report of Commissioners, 1869-70. NEW YORK State, p. 406.

Paris. Portes cochères and entrance gates. KRAFFT, 1810.

Philadelphia. PHILADELPHIA, pp. 33–4. Public Ledger Building. CHILDS (G. W.), 1868.

Rome. Office of the Ministry of Finance. CANEVARI, 1875.

—— Barberini Palace. TETIUS, 1642.

—— Roman Villas of the Augustan Age. MOULE, 1833.

Russian Magazines, Storehouses, etc. Atlas of designs of. RUSSIA. Add. 532.

Salisbury Cathedral. PRICE (F.), 1755.

Scotland, Churches in the Highlands of. Acts for building additional ones and report of the Commissioners. SCOTLAND, 1823, 1824, 1825–35, p. 174.

Serapis, Temple of, at Pozzuoli, near Naples. BABBAGE (C.), 1847.

Singapore, New Government House. Designs. SINGAPORE, 1868.

Spalatro. Ruins of the palace of the Emperor Diocletian. ADAM (Robert), [1764].

Sydney. New Central Police Court, Report on. SYDNEY, 1888, p. 272.

—— Proposed Hospital Buildings, Macquarie Street. Report, Plans, etc. SYDNEY, 1891, p. 272.

Victoria. Public Buildings. Amounts expended on them. VICTORIA, 1851–2, p. 377.

Wells Cathedral history. BRITTON, 1847.

Woolwich. Royal Engineers' Establishment on the opening of the new Lecture theatre. SIMMONS (Col.), 1861.

Würtemberg. Palaces and Country Seats. LEINS, 1889.

See also ARCHITECTURE.

BUOYS. *See* BEACONS, Buoys, etc.

BURIALS.

Inquiry into the practice of Interments in Towns, 1843. PARLIAMENTARY..Papers, p. 521.

London Metropolitan Interment Act. Reports of preliminary proceedings, 1851. LONDON, p. 255.

—— Metropolitan Burials Act. Returns, 1852. LONDON, p. 255.

—— Revolting practices in St. Giles's Cemetery. LONDON, p. 255.

Reports on interment in towns, 1843, '53. Report on extramural sepulture, 1850. PARLIAMENTARY..Papers, p. 468.

BUTTER.

Artificial Butter Manufacture. MOTT, 1876.

Butter and Cheese. BEVAN (G. P.), Industries, vol. 12.

C.

CABINET MAKING, practical. ANONYMOUS, 1826, p. 52.

CABLES.
Hallidie system. HALLIDIE, 1882.
Patent Iron.. BROWN (Sir S.), 1816.
See also CHAIN CABLES, TELEGRAPH CABLES.

CABS, London. The "course" system. HADDAN (J. L.), (1878 ?).

CAISSONS. Introduction of the patent Metallic Caisson, in forming piers, harbours, etc. DEEBLE, 1827.

CAISSONS (SHIP) for dock basins and dry docks.
ANDREWS (J. J. F.), 1891.
See also COFFERDAMS.

CALCULATING MACHINES. FAVARO, 1876.
Abacus or Counter by Lalanne. OLIVIER (J.), 1846.
Adding up Counter with two rollers and with differential movement. RAFFARD, 1889.
Graphic calculation. FAVARO, 1872.
Instrument for performing mechanically the Involution and Evolution of numbers, Description.
ROGET (P. M.), 1815. App. 574.
Machine for calculating the products, quotients, logarithms, and powers of numbers. MOSELEY, 1847.
Machine for finding the numerical roots of Equations.
BASHFORTH, 1845, 1892.
Tables calculated and printed by machinery.
SCHEUTZ (G. and E.), 1857.
Theory of continuous Calculating Machines. HELE-SHAW, 1885.
Babbage's calculating engines.
BABBAGE (C.), 1843; BABBAGE (H. P.), 1889.
Babbage's Analytical Engine. Mechanical arrangements.
BABBAGE (H. P.), 1888.
Edmondson's Circular Calculating Machine. Instructions for use.
EDMONDSON, 1885.
Swedish Tabulating Machine. SCHEUTZ (G.), 1856.
Thomas' Calculating Machine.
REULEAUX, 1892; FRANCOEUR (L. B.), 1822. App. 557.
Thomas de Colmar's Calculating Machine, called Arithmometer.
HOYAU, 1822. App. 562.

CALCULATION. Intuitive Calculations. O'GORMAN, 1879.

CALENDAR. *See* CHRONOLOGY.

CALICO-PRINTING. CRACE-CALVERT, 1876.
Practice and Principles of Calico Printing, Bleaching, Dyeing, &c. OLIVER, 1870.

CANALS (GENERAL REFERENCES). AITKEN (R.), 1871–72; ANONYMOUS, p. 42; BOILEAU (P.), 1878, 1881; DUPIN, 1831; GIRARD (P. S.), 1804, 1820, 1824; the article "Canal" from Rees's Encyclopædia. ANONYMOUS, 1819, p. 41. Letter on Canals. ANONYMOUS, 1825, p. 48. Navigable Canal. FRISI, 1818; GERSTNER, 1827; HUERNE DE POMMEUSE, 1822; JAMES (E. J.), 1890; LECCHI, 1824. Papers relating to Canals. PAGE (Col. F.), 1843. Add. 525. Treatises. SUTCLIFFE (J.), 1816; VERNON-HARCOURT (L. F.), 1882. Article in Chambers's Encyclopædia. VERNON-HARCOURT (L. F.), 1888; Inland Navigation. WHEELER (W. H.), 1889.

Banks (Canal), Consolidation. SCHLICHTING (J.), 1892; SLEIJDEN (P. W. van der), 1892.

Canal Association. CANAL ASSOC., 1855–75.

Charges. Bill for revision, 1888. Board of Trade Rules, 1888. Return for Draft Rules, 1888. Railway and Canal Commission Rules, 1889. PARLIAMENTARY..Papers, p. 505–6.

Committee (Select) on Canals, Report, 1883. PARLIAMENTARY..Papers, p. 469.

Construction. Standard Construction for Canals. YATES (J. A.), 1886.

—— Construction of Navigable Canals. DUCREST, 1809.

Cuttings and Embankments. Tables for calculating the cubic quantity of Earthwork. MACNEILL, 1833.

Digest of the Opinion of Parliament on the Powers and Management of Canals. GRAHAME (J.), 1886.

District Canals. Construction and Management. GREY (L. J. H.), 1885.

Duke of Bridgewater's Inland Navigations. ANONYMOUS, 1766–69, p. 47.

Economic relation to Transportation. HAUPT (L. M.), 1890.

Engineering (Canal): its past, present, and future. VERNON-HARCOURT (L. F.), 1888.

Equipment, modern, of canals and harbours. SCHEMFIL, 1882.

Formula for mean velocity of discharge of Canals. KUTTER, 1873, '76.

Free canals essential to the State's prosperity. RICHMOND (A.), 1878.

CANALS (GENERAL REFERENCES)—*continued.*

History. ANONYMOUS, 1835, p. 41.

How to make state canals without borrowing. PRINSEP (E. A.), 1870.

Importance and utility. WHITWORTH (R.), 1773–4.

Improvement of Canal Navigation. FULTON (R.), 1796.

Inundation Canals. BELLASIS, 1873.

Law relating to Canals. WEBSTER (R. G.), 1885. Law relating to rates and traffic. BUTTERWORTH and Ellis, 1889.

Laying out of. BAUDSON, 1884.

Locks of Canals. ANONYMOUS, p. 49.

Maps of English Canals. ANONYMOUS, p. 41.

Means of passing the falls of canals. GRUSON and Barbet, 1889.

Method of conveying boats or barges from a higher level to a lower, and *vice versâ*, by the immersion of a plunger or plungers. HUDLESTON (L.), 1801.

Methods employed in Italy for rendering canals water-tight. BOMPIANI and Luiggi, 1892.

Modes of setting out the curved portions of canals. LALL (K.), 1854.

Navigation Canals. HAGEN (G.), 1863.

Normal profiles. HOLTZ, 1886.

Plan for passing declivities on Canals with little expenditure of water. GRAHAME (T.), 1836.

Practical results of experiments on Canal Navigation. ELLIS (R.), 1835.

Railways and Canals. Bills for regulation of Railway and Canal Traffic, 1886, '87. Amended 1888. Act 1888 amending Acts, 1892, '94. PARLIAMENTARY..Papers, p. 504.

—— Canals destroyed by the Railway Companies. SPENCE (E.), 1882.

—— Comparative merit of. ANONYMOUS, 1832, p. 48.

—— Compared with Railways. ANONYMOUS, 1825, p. 54.

—— Comparative performances of motive power on Canals and Railroads. GRAHAME (T.), 1831.

—— Conveyance upon, compared with that of Railways. ANONYMOUS, 1831, p. 43.

—— Railway and Canal Combination. GRAHAME (T.), 1852.

—— Railway and Canal Commission. BUTTERWORTH, 1889.

—— Railway and Canal Traffic Bill. RAILWAY AND CANAL TRADERS' ASSOCIATION, 1888. Traffic Act, 1888. HUNTER (W. A.), 1889. Rules, 1888. Returns to Board of Trade, 1890, &c. Return of Owners, 1892. PARLIAMENTARY..Papers, p. 469.

—— Report on Railway, Canal, Tramway, Gas and Water Bills, 1854, &c. PARLIAMENTARY..Papers, p. 504.

CANALS (GENERAL REFERENCES)—*continued.*

Railways and Canals. Reports of the Railway and Canal Commission, 1890, &c. PARLIAMENTARY..Papers, p. 500.

—— Reports of Select Committee on Railways and Canals Amalgamation, 1846. PARLIAMENTARY..Papers, p. 501.

—— Respective uses of Water-ways and Railroads. FLEURY, 1892; PESCHECK, 1892.

Rates, Tolls and Charges Confirmation Bills, Nos. 1–12. Return giving names of the Railway and Canal Companies comprised in. PARLIAMENTARY..Papers, 1894. Add. 526. Provisional Order Bills. Report from joint Committee of the House of Lords and House of Commons, 1893. PARLIAMENTARY..Papers, p. 469. Report from the Joint Select Committee on. PARLIAMENTARY..Papers, 1894. Add. 525.

Resistance of Water to the passage of boats upon Canals. MACNEILL, 1833.

Rules for Calculating the Velocity and discharge of Open Canals. LALL (K.), 1858.

State of the Canals (France). BECQUEY, 1823.

Statistics. SALT (S.), 1845.

Tables, Canal and Culvert. JACKSON (L. d'A.), 1878.

Tables for setting out Half-widths. OLVER, 1870.

Transport. PERIODICAL PUBLICATIONS, p. 25.

Transportation. Respective uses of Waterways and Railways. SCHROMM (A.), 188C.

Various systems of Canal Navigation. CHAPMAN (W.), 1797, p. 241.

Works connected with navigation. MINARD, 1841.

See also INLAND NAVIGATION.

CANALS (PARTICULAR).

Aberdare Canal Act, 1793. ABERDARE Canal.

Aberdeenshire Canal Acts, 1796, 1809. ABERDEENSHIRE.

Agra Canal. Papers, 1867–71. Atlas of Plans, 1884. INDIA, p. 109.

Aire and Calder Navigation. BARNSLEY Canal, 1871.

America (North). LANGE (F.), 1885.

—— United States. PURDY, 1880.

—— Canal Enlargement between Lake Erie and Montreal. PAGE (J.), 1877.

—— Description of Canals. TANNER (H. S.), 1840.

—— Proposed Tide Level Canal from the Gulf of Uraba to that of St. Michel. GOGORZA, 1888.

—— Waterway between the Great Lakes and the Atlantic Seaboard. CORTHELL, 1891.

—— United States and Canada. Notes on canals in. WALCH (G. T.), 1877.

CANALS (PARTICULAR)—*continued.*

Antwerp to the Rhine. GOBERT, 1888.

Apedale to Newcastle-under-Lyme. Act for Canal. APEDALE CANAL, 1775.

Aragon and Real de Tauste Canals. Description. SASTAGO (Count De), 1796.

Ardennes Canal. Memoir. SARTORIS (U.), 1821. Ardennes and Duc d'Angoulême canals. Ordonnance. SARTORIS (U.), 1823.

Arun to Chichester Harbour, Navigable Canal from the River, and from thence to Langstone and Portsmouth Harbour. Act. PORTSMOUTH and Arundel, 1817. Act for further powers. PORTSMOUTH and Arundel, 1819.

Ashby-de-la-Zouch Canal Act. ASHBY-DE-LA-ZOUCH, 1794.

Aube, Département de l', Canaux de submersion. BOUFFET, 1889.

Austria. Voyage à Vienne. GOBERT, 1886.

Babylonia. ANDREW (Sir W. P.), 1886.

Baie Verte Canal. Profiles of the several lines surveyed for a canal to connect the Bay of Fundy with the Northumberland Straits. KEEFER (S.), 1873. Baie Verte and Welland. KEEFER (S.), 1875.

Baltic Canal. BESEKE, 1893. Map. JAHN, 1886.

Baree Doab Canal, 1868–69. INDIA, p. 110.

Barnsley Canal Navigation Act. BARNSLEY Canal, 1793, 1808, 1871.

Basingstoke, Canal from, to communicate with the River Wey. BASINGSTOKE Canal, 1778.

Batavia, Harbour at Tandjong Priok. BATAVIA, 1876.

Bath and Bristol Canal. Act and Prospectus. BATH, 1811.

Belgium. Stoppages on Canals and Canalized Rivers in Belgium. MAILLIET, 1892. Water supply. LEBOUCQ, 1892.

Belgium and part of France, history and statistics. LA RIVE, 1835.

Bengal. Canal between Ooltadanagh and Dhappa, 1854. INDIA, p. 110.

—— Midnapore Canal. KIMBER, 1876.

Berlin. HOBRECHT, 1884.

Betwa Canal project in the North-West Provinces, 1887. INDIA, p. 111.

Bigaree Canal, enlargement of. INDIA, p. 111.

Birmingham and Bilston Canal Act, 1768. BIRMINGHAM & B. C.

Birmingham and Fazeley Canal Act, 1827. BIRMINGHAM & F. C.

Birmingham Canal Acts, 1768–1818, 1835, 1839. BIRMINGHAM Canal.

Bologna. BOLOGNA, 1825.

Borrowstowness Canal, Amended Act, 1783. BORROWSTOWNESS.

CANALS (PARTICULAR)—*continued.*

Bossuyt to Courtray. BOSSUYT, 1838.

Bourgogne Canal. PERROUET, 1788. Electric towing in the tunnel of Pouilly. BOURGOGNE, 1892.

Bradford Canal and Leeds and Liverpool Canal Company. BRADFORD Canal, 1867.

Brecknock and Abergavenny Canal Acts. BRECKNOCK, 1793, 1804.

Bridgewater Canal Extension Act, 1795. BRIDGEWATER Canal.

—— Walkden Moor underground inclined plane. EGERTON (F. G.), 1812.

Bristol Canal. Utility of a Canal from Bristol to Bath. BRISTOL Canal, 1795.

Brussels and Charleroi, communication between. BARTHÉLEMY (A. J.), 1817.

Buckingham Canal, 1886. INDIA, p. 113.

Burton and Fradley Canal Bill, 1794. BURTON.

Caistor Canal Act for making a navigable Canal from the river Ancholme to Caistor. CAISTOR, 1793.

Calcutta Eastern Canals. INDIA, 1883, p. 99.

Caledonian Canal, Act for construction, 1804. CALEDONIAN Canal, 1804. Information relating to. STEVENSON (R.). 1817. Letter from Mr. Munro. CALEDONIAN Canal, 1840.

—— Management of the waters. FLACHAT, 1828.

—— Sir W. E. Parry's Report. CALEDONIAN Canal, 1842. Sketches and Estimates of machinery used in construction. TELFORD (T.), 1817, p. 288. Reports of the Commissioners. CALEDONIAN Canal, 1804, etc. Report of the Committee of the House of Commons. CALEDONIAN Canal, 1805. Walker's Report. CALEDONIAN Canal, 1838. Report of Select Committee. CALEDONIAN Canal, 1839. Report on the damage to the works caused by the floods of Jan. 24 and 25, 1849. WALKER (James), p. 394.

Cambridge Canal. Arguments for and against the intended Canal from Cambridge to the river Stort. CAMBRIDGE C., 1788.

Canada. KEEFER (T. C.), 1894.

—— History and Cost. KINGSFORD, 1865.

—— Statistics for 1877. CANADA, p. 216.

—— Report of chief engineer, 1880. CANADA, p. 216.

—— Reports of the Minister for Railways and Canals. CANADA, 1882, etc., p. 218.

—— Welland Canal Enlargement. Reports. WELLAND Canal, 1872, '73.

CANALS (PARTICULAR)—*continued.*

Carlisle to Fisher's Folly, Canal from.
CHAPMAN (W.), 1823, p. 241.

Carlisle to the Sea, means of obtaining a safe and commodious communication from. CHAPMAN (W.), 1807, p. 242.

Carlisle and Solway Firth, proposed navigation between. CHAPMAN (W.), 1818, p. 243. Carlisle Canal. CARLISLE Canal, 1819.

Castle Orchards, Sheffield to the River Dee below Tinsley, proposed Canal from. CHAPMAN (W.), 1814, p. 243.

Central Union Canal to unite the Birmingham, Warwick, and Birmingham, Coventry and Oxford Canals.
CUBITT (Sir W.), 1832.

Charleroi. CHARLEROI, 1839.

Chesapeake and Delaware Canal. GILPIN (J.), 1821. Report of Company. CHESAPEAKE, 1825.

Chesapeake and Ohio Canal Report. CHESAPEAKE, 1874. Canal to connect the Chesapeake and Ohio Canal with Baltimore.
ABERT (J. J.), 1874.

Chester Canal Acts, 1777. CHESTER Canal.

China. Canals and inclined planes.
CHAPMAN (W.), 1797, p. 241.

Costa Rica. Survey for Canal through the River Sapoa to the port of Salinas or Bulaños. OERSTED, 1851.

Coventry Canal to Coal Mines of Measham, Oakthorp, Domsthorp, and Ashby-Woulds. Plan of the intended navigable canal from. WHITWORTH (R.), 1871.

Coventry to Oxford. Acts, 1769, 1774, Amending Act, 1819.
COVENTRY Canal.

Crinan. Act for payment of money for completing the Canal, 1816. CRINAN Canal. Reports from the Select Committee.
CALEDONIAN Canal, 1839.

Cromford Canal. Act for making and maintaining, 1789. Amending Act, 1790. CROMFORD.

Croydon Canal. Act for making and maintaining a Navigable Canal from Croydon into the Grand Surrey Canal, 1801. Acts for completion, 1808, 1811. CROYDON Canal. Plan.
GRANTHAM (J.), 1811.

Croydon and Portsmouth, Canal proposed between.
RENNIE (J.), 1803.

Croydon, Navigation from, to the Thames at Rotherhithe.
DODD, 1799.

Cumberland Canal (Proposed). Report.
TELFORD (T.), 1808, p. 287.

Delaware, near Easton. Canal to unite the River with the Passaic, near Newark. DELAWARE Canal, 1823.

CANALS (PARTICULAR)—*continued.*

Derwent, at East Collingwith. Navigable Canal from the River, to Pocklington, Yorks. Act for making.
POCKLINGTON Canal, 1815.

Doab Canal. Sketches of Works. DOAB Canal, 1832–38.

—— and Deyra Doon watercourses.
THOMASON Civil Engineering Coll., 1853–4.

Don and the Volga, Canal between the. DRU, 1886.

Donau-Oder Canal. PONTZEN, 1872.

Dorset and Somerset Canal Act, 1803. DORSET.

Dudley Canal Acts, 1776, 1785, 1793, 1796. DUDLEY Canal.

Dun Navigation Cut. Canal from the River in the township of Swinton to Barnsley. Act, 1793. DEARNE.

Eagle Hawk Neck, Canal through. EAGLE Hawk Neck, 1890.

Edinburgh and Glasgow Union Canal (proposed). BAIRD (H.), 1813. Edinburgh and Glasgow Union Canal Acts, 1817, 1819. EDINBURGH and Glasgow. Correspondence, Report, etc. EDINBURGH and Glasgow, 1814, '17, '26. To form a juncture with the Forth and Clyde Canal at Lock No. 20, and also with the port of Leith and the Broomielaw at Glasgow. Report. STEVENSON (R.), 1817. Edinburgh and Glasgow, Mineral Survey along the track. BALD (R.), 1814. Edinburgh and Glasgow Union Canal, Report on. TELFORD (T.), 1817, p. 287. Answers to the report. CHEYNE (A.), 1829.

Egypt (Lower), Irrigation Canal. JONES (Helsham), 1882.

—— Sweet-Water Canal through Egypt.
FOWLER (Sir J.) and Baker, 1884.

—— Ellesmere Canal Acts, 1793, 1796, 1801, 1802, 1804, 1810, Report 1805. ELLESMERE Canal. Act for uniting the Ellesmere and Chester Canals, 1813. ELLESMERE Canal.

England. National Canal between the four Rivers a national necessity. LLOYD (S.), 1888, '89.

Enniscorthy to Ballinaslany. Bill for making a canal from.
SLANEY (River), 1833.

Erie Canal. Methods of Traction. BOGART, 1892.

Erie and Champlain Canals, ERIE Canal, 1825. Laws, Reports, etc. NEW YORK STATE, 1825. Canals to connect the western and northern Lakes with the Atlantic Ocean. NEW YORK STATE, 1821. Tolls, Trade and Tonnage of the Canals, 1851–75. NEW YORK STATE.

Essex. Act for making a canal in the County of.
ROMFORD Canal, 1875.

Exeter Canal from 1563 to 1724, and 1819 to 1830.
DELAGARDE, 1845.

Flint. Act for the construction of the Flint Canal, 1778.
FLINT Canal.

CANALS (PARTICULAR)—*continued.*

Fort St. Phillip Canal. FORT ST. PHILLIP, 1874.

Forth and the Clyde, intended navigation between the. GRAY (J.), 1768. Report on its practicability. SMEATON (J.), 1768, p. 208. Act for forming a junction between the Forth and Clyde Navigation and the Monkland Navigation, 1790. MONKLAND Navigation. Forth and Clyde Canal Acts, 1787, 1790, 1799, 1806, '14, '20. FORTH and Clyde Canal. Rules and Regulations, 1820. FORTH and Clyde Canal. Tables of Tolls, 1821, '22. FORTH and Clyde Canal. Navigation. FORTH and Clyde Canal, 1814, 1816. Rules and regulations for Trawlers. FINLAY, 1820–22.

Forth and Clyde and Edinburgh and Glasgow Union Canals, ELLIS (R.), 1835.

Foss Canal. Junction of the Rivers Foss and Ouse Acts, 1793, 1801. Foss Canal.

France, 1872–74. FRANCE, p. 440; GŒVRY, 1806–7.

—— French Canals. SAY (J. B.), 1818; WATSON (William), Ph.D., of Boston, 1892.

—— Navigable Canals. FER DE LA NOUERRE, 1786.

—— Canal Banks. RESLIN, 1892.

—— Influence on industrial prosperity. PILLET-WILL, 1837.

—— Reflections on the Yvette scheme. FER DE LA NOUERRE, 1786.

—— Stoppages on Canals and Canalised Rivers. CAPTIER, 1892.

—— Stoppages on Navigable Ways (Central Region). MAZOYER, 1892.

—— Traction on Canals. North and East. DERÔME, 1892.

—— Water Supply of Canals east of France. DENYS, 1892.

—— French canals, particularly the Canal du Centre. GAUTHEY, 1816.

—— Canals of Orléans, of Briare and of Loing. Maps, 1739. ORLÉANS.

—— Navigable Canals for Picardy, Artois, and the whole of France. LINGUET, 1769.

France (North). Consolidation of the Canal Banks. PESLIN, 1892.

Franzens Canal, Budapest. HEINCZ, 1886.

Ganges Canal. CAUTLEY, 1860, 1863, 1864; GLOVER (T. G.), 1867; SMITH (Col. B.), 1870. Album of Views, 1885. INDIA, p. 118. Account of the Canal, 1853. INDIA, p. 118. Description. LOGIN, 1857, '67. Estimates, revenue reports, etc., 1845, '50, '56. INDIA, p. 118. Instructions for the Executive Officers, 1847. INDIA, p. 118. Projection and present state, and measures required to make it useful and

CANALS (PARTICULAR)—*continued.*

profitable. COTTON (Sir A.) and Cautley, 1864, '65. Reports, 1845, '65, '66, '67. INDIA, p. 118. Reports on remodelling the Canal, 1864–67. INDIA, p. 118. Lower Ganges Canal, 1871–77. INDIA, p. 118.

Germany. Stoppages on Canals and Canalised Rivers. GERMELMANN, 1892.

—— Management. BELLINGRATH, 1879; KLETT, 1881.

Glamorganshire Canal Dock Bill, 1878. GLAMORGANSHIRE Canal.

Glasgow to the West Coast of Ayr. Suggestions relative to Canal. TELFORD (T.), 1804, p. 288; TELFORD (T.), 1805, p. 287.

Glasgow, Paisley, and Ardrossan Canal Act, 1806, and Amended Act, 1827. GLASGOW.

Gloucester and Berkeley Canal. CLEGRAM (W. B.), 1863. Acts 1793, 1797, 1805, 1818. GLOUCESTER. Bill for consolidating shares of the Proprietors, 1832. GLOUCESTER. Minutes on Canal Bill, 1874. GLOUCESTER. Observations. UPTON (J.), 1815.

Gloucestershire. Canal at the foot of Coombe Hill, to join the River Severn at. COOMBE Hill Canal, 1792.

Gotha Canal, Sweden. Method of construction. PLATEN, 1822.

Grand Canal. Defence of the Court of Directors. SMITH (Sir William C.), 1815.

Grand Commercial Canal (proposed), having for its object the union of the Peak forest, Sheffield, Chesterfield and Cromford Canals. HASLEHURST, 1824.

Grand Junction Canal. Acts 1793, 1794, 1795, 1801, 1803, 1805, 1812, 1818. GRAND JUNCTION. Classification of Merchandise Traffic, 1893. GRAND JUNCTION. Tonnage Rates and drawbacks, 1836. GRAND JUNCTION. Proposed London and Birmingham Canal. GRAND JUNCTION, 1836. Reports, 1804, '5, '10, '11. GRAND JUNCTION. Branch Canal to Slough Bill, 1879. GRAND JUNCTION. Unequal charges for the tonnage of coals. DURELL, 1845.

Grand Southern Canal, proposed navigable canal between, and Merstham. BANKS (E.), 1810.

Grand Surrey Canal. Acts 1807, '8, '11. GRAND Surrey Canal. Act for a cut communicating with Rotherhithe, 1811. GRAND Surrey Canal.

Grand Union Canal. Act 1810. GRAND Union.

Grand Victorian North Western Canal Company. Prospectus. GRAND Victorian.

Grantham Canal. Acts 1793, '97. GRANTHAM Canal.

Grantham and Sleaford, Junction Canal between. Description of a plan. ROFE, J., and Son, 1833.

Great Britain. LEFELDT, 1872.

CANALS (PARTICULAR)—*continued.*

Great Britain. Canal Navigation. HIBBARD, 1793; PRIESTLEY (J.), 1831. In relation to British Trade and Government control. ANONYMOUS, 1885, p. 41.

—— Map of England. BRADSHAW (G.), 1820.

—— Navigable canals throughout. Plans. CARY, 1795.

Great Western Canal. Acts 1796, 1811. GRAND Western. Act to alter and increase the rates of Tonnage, 1812. GRAND Western.

Greece. Corinth Canal Society. Regulations for Navigation. CORINTH, 1893.

Hants and Berks Canal. Proposed navigable canal from the Kennet, at Midgham, to join the Basingstoke Canal. HANTS, 1825.

Harborough and Stamford Canal projected. FOX (J. J.), 1811.

Haslingden. Act 1874. HASLINGDEN CANAL.

Havre to Tancarville Canal. WIDMER (Maurice), 1887.

Heilbronn. Canalisation. GORDON (J.), 1876.

Hereford and Gloucester Canal. Acts 1791, 1793. HEREFORD.

Hexham to Haydon Bridge. Report and observations, and from Newcastle to Haydon Bridge. SUTCLIFFE (J.), 1797.

Holland. HOLLAND, p. 65.

—— Great North Holland Canal. JACKSON (G. B. W.), 1846.

—— North Sea Canal of Holland. BARNARD (J. G.), 1872.

Huddersfield Canal. Acts. HUDDERSFIELD, 1794, 1800; PONTEY, 1810.

Hull. Canal from the River, to Leven Bridge. Amended Act, 1805. HULL (River).

Hyderabad Canal. Clearances, 1856–59. INDIA, p. 120.

Illinois and Mississippi Canal. Proposed waterway from Lake Michigan to the Mississippi. HENDERSON (T. J.), 1893. Add. 507.

India. MURRAY (A. G.), 1877. Grants of Water power from Canals. INDIA, 1882, p. 99. Number of miles of navigable canals. INDIA, 1859, p. 107. Traffic. LOGIN, 1866, '67, '69. Coast Canal locks. INDIA, 1882, p. 99.

—— Collection of Canal Revenue. INDIA, 1861, p. 99.

—— Slope Tables, 1851. INDIA, p. 99.

Ireland. Canal Extension. DAWSON (J.), 1819.

—— Advantages of bringing the Grand Canal round by the circular road into the River Liffey. CHAPMAN (W.), 1785, p. 241.

—— Grand Canal. Plan for making the Philiptown level the summit level, by lowering the present summit 16 feet.

CANALS (PARTICULAR)—*continued.*

KILLALLY, 1808. Report of Directors. GRAND CANAL 1816. Speech in the House, on moving for a Select Committee on the subject. TULLAMORE (Lord), 1830. Acts, papers, and reports, etc. ROYAL Canal, Ireland, 1803, 1812, 1813, 1815, 1817.

Ireland. Proposed Plan of an Inland cut from Burn's Island to Leighlin. CHAPMAN (W.), 1791.

Italy. MOSCA, 1818.

—— Cavour Canal. AJRAGHI, 1872; BENAZZO, 1875; CAVOUR, 1893; GRUEBER, 1886; MARCHETTI, 1880; PASINI and Gioppi, 1893.

——Villaresi Canal. CIPOLLETTI, 1886.

Italy and France, Navigable and Irrigation Canals. WIEBEKING (C. F. von), 1838–9.

Jordan Canal. HENLEY, 1883.

Jumna Canal, N.W. Provinces. CAUTLEY, 1864.

Kendal, proposed canal from, to the Duke of Bridgewater's Canal leading to Manchester. BURDETT & Beck, 1769.

Kennet and Avon Canal. EWART (J.), 1796. Acts 1794, 1796, 1801, 1805, 1809. KENNET and Avon.

—— Scheme for extending the navigation, 1788. KENNET and Avon.

—— Comparative merits of inland communication by Navigation or Railroads. KENNET and Avon, 1825.

—— Statement, 1810; description, 1811. KENNET and Avon.

Kent, Weald of, Canal Act, 1812. WEALD of Kent Canal.

Keyn Canal Project, 1878. INDIA, p. 121.

Kingstown and Dublin Canal. Report, 1833. KINGSTOWN.

Knaresboro', proposed navigation to. BURTON, 1802. Knaresborough Canal. Report on levels, surveys and estimates, 1802. KNARESBOROUGH Canal.

Krau-Chai-Ya-Talung, Opening of the Isthmus of. DRU, 1881, '82.

Lancaster Canal. Acts 1792, '93, '96, 1800, 1807. LANCASTER Canal.

Languedoc. LALANDE, 1778.

Languedoc Canal. Atlas and description. LA ROCHE, 1787. History. LANGUEDOC Canal.

—— Description of the works. FROIDOUR, 1672.

Lapworth and Kingswood Canal. Case in support of the Bill, 1795. LAPWORTH and Kingswood Canal.

Leeds and Liverpool Canal. Acts 1770, '83, '90, '94, 1819. LEEDS, p. 226. Classification of Merchandise Traffic. Bills 1893. LEEDS, p. 226.

Leicester Canal. Acts 1791, '97, 1800. LEICESTER Canal.

CANALS (PARTICULAR)—*continued.*

Leicestershire and Northamptonshire Union Canal. BARNES (J.), 1802. Acts, 1793, 1805. LEICESTERSHIRE.

Leominster Canal. Acts 1791, '96, 1803. LEOMINSTER Canal.

Leven Canal, Yorkshire. Acts 1801, 1805. LEVEN Canal.

Liverpool and Hull Canal. Plan of a proposed navigable Canal. LIVERPOOL and Hull.

Loire (La). Advantages of a Canal. BAUDE, 1822.

—— Canal parallel to the Loire. LOIRE, 1890.

London Canal from Boulter's lock to Isleworth on the Thames. Report to the Subscribers. WHITWORTH (R.) and Mylne, 1794.

London Canal and Railroad. Remarks on the projected. TATHAM (W.), 1803.

—— Intended North London Canal Navigation. DODD, 1802.

London (West of) Navigation. ALLNUTT (Z.), 1815.

London and Cambridge Canal. PONTEY, 1810. London and Cambridge Junction Canal. Acts 1812, '14. Minutes of evidence before Committee of the House of Commons, 1812. LONDON and Cambridge.

London and Hampshire Canal. OUSE, 1891.

London and Liverpool. A plan for the amalgamation of Canals between. TOWNSHEND (T.), 1846.

London and Portsmouth, respective merits of the proposed Canal and Iron railway from. MARSHALL (R.), 1803.

London and Western Canal, lately Hampton Gay Canal, 1792. LONDON and Western Canal.

Lough Allen to Shannon Navigation. ALLEN, Lough.

Macclesfield Canal. Act 1826. MACCLESFIELD Canal.

Manchester, Ashton-under-Lyne and Oldham Canal. Acts 1792, '93, '98, 1800, 1805. MANCHESTER, Ashton and Oldham.

Manchester, Bolton and Bury Canal. Acts 1791, 1805. MANCHESTER, Bolton and Bury.

Marne, junction of the, to the Seine. CORDIER, 1827–29.

Marne-Saone. KELLER (K.), 1882.

Marne-Rhine. GRAEFF, 1861.

Marne-Rhine and Canal de l'Est. PICARD, 1880.

Marne to the Rhine. Competition between canals and railways. COLLIGNON (C.), 1845.

Marseilles. Aqueduct on the Canal. RENNIE (G.), 1855. Marseilles Canal. Bridge aqueduct of Roquefavour. MARSEILLES Canal, 1854.

—— Plan and profile of the principal line. MARSEILLES Canal, 1880.

Melbourne and Hobson's Bay, improvement of the water communication between. CHRISTY (F. C.), 1879.

CANALS (PARTICULAR)—*continued.*

Merthyr Tydfil, Canal from, to the Bank near Cardiff. Acts 1790, 1796. GLAMORGANSHIRE Canal.

Meuse, Junction of canal of, and Rhine. HAGEAU, 1819.

Mitrow Canal, 1867. INDIA, p. 126.

Monkey Island, proposed Canal from, to Isleworth. Queries answered. BRINDLEY, 1770.

Monkland, Act for making and maintaining a Navigable Cut or Canal and Waggon-way from Collieries of, to Glasgow, 1770. Act for amending, 1813. MONKLAND Navigation.

Mons Canal. Junction of the Meuse and the Scheldt. MONS, 1819, '40.

Montgomeryshire Canal. Acts 1794, 1815. MONTGOMERYSHIRE.

—— Case of the Company in respect of the proposed tax on inland navigation. MONTGOMERYSHIRE, 1797. Western Branch. PUGH (W.), 1834.

Morris Canal and Banking Company. Report, 1861. MORRIS Canal.

Murray (River) Canal. Estimate of proposed Canal. MURRAY River, 1874.

Nahrwan Canal. JONES (J. F.), 1857.

Neath Canal. Act and amended Act, 1791–98. NEATH Canal.

Neath and Swansea Red Jacket and Junction Canals. Particulars relating to their formation, course, and use. TENNANT (G.), 1824.

New Chitpore lock. INDIA, 1883, p. 99.

New York State. Reports 1854–80, '89, '91. NEW YORK STATE.

New York. Canals to connect Western and Northern lakes with Atlantic Ocean. HAINES, 1821.

Newbury and Bath Canal. Papers and Plans, 1790. NEWBURY and Bath Canal.

Newcastle and Maryport Canal. Probable commerce and revenue, 1796, 1802, 1807. NEWCASTLE and Maryport.

Newcastle or N. Shields towards Cumberland. Observations on the line of country through which a canal may be carried. THOMPSON (Jona), 1795.

Newcastle-under-Lyme Junction Canal. Act 1798. NEWCASTLE-under-Lyme.

Newport Pagnell, Act for making a navigable Canal from, to the Grand Junction Canal at Great Linford, 1814. NEWPORT PAGNELL.

Nira Canal. WHITING (J. E.), 1883.

Nira Canal project, Poona district, 1892. INDIA, p. 127.

North Sea, Canals from the, to the Baltic. TIMONOFF (V. E.), 1893.

North Walsham and Dilham Canal. Act 1812. NORTH Walsham.

CANALS (PARTICULAR)—*continued.*

North-West Provinces, 1865. INDIA, p. 127. North-Western Provinces and Oudh. Map. INDIA, p. 127.

North Wilts Canal. Act 1813. NORTH Wilts.

Norwich and Lowestoft Canal. Evidence before Committee, 1826. NORWICH and Lowestoft Canal.

Nottingham Canal. Act 1792. NOTTINGHAM Canal.

Nova Scotia. Shubenaccadie Canal Co. Charter and Bylaws. SHUBENACCADIE Canal Co., 1829.

Nutbrook Canal. Act 1793. NUTBROOK Canal.

Oakham Canal. Act 1793. OAKHAM Canal.

Oder-Lateral Canal. HERR, 1880.

Oder-Warthe-Netze Canal. HAVESTADT (C.) and Contag, 1883.

Orissa Canals. Papers 1884, '85, '89. INDIA, p. 128.

Ourcq Canal. BERTRAND (P.), 1805; GIRARD (P. S.), 1812, 1819, 1831–43.

Oxford Canal. Act for making, 1769. Act to consolidate several Acts, 1829. OXFORD Canal. Between Longford and Wolphamcote. Map of the intended improvements along part of the line. VIGNOLES (C. B.), 1828.

Paris, Canal Maritime de, à Rouen. FLACHAT and Bayard de la Vingtrie, 1829.

Peak Forest Canal. Acts 1794, 1805. PEAK Forest.

Penclawdd Canal. Act 1811. PENCLAWDD Canal.

Pennsylvania Canal Navigation. History. PENNSYLVANIA, 1795.

Pontnewynydd Canal. Act for making. PONTNEWYNYDD, 1792.

Raiyān Canal and Reservoir, Notes on. WHITEHOUSE (Cope), 1889.

Reading, Report on the several lines of canals projected between, and Isleworth. RENNIE (J.), 1794.

Regent's Canal, from the Grand Junction Canal to the River Thames. Act. REGENT'S Canal, 1812. Acts to alter and amend the Act of 1812. REGENT'S Canal, 1813–19.

Rhine basin, Canalised Rivers and free Rivers of. Traction of Boats. Report. MÜTZE, 1892. Waterways and transport trade. BORGHT, 1892.

Rhine to the Sea Canal. ANONYMOUS, 1888, p. 56.

Rhone, Valley of the. Irrigation Canal. LEGER, 1883.

Rickmansworth, Design for bringing a navigable river from, to St. Giles's-in-the-Fields. FORDE (E.), 1720.

Rio Cobre, Irrigation Canal from the. HUTCHINS, 1872.

Rio de la Plata. Navigation between the port of Buenos Aires and the Parana de Las Palmas. MITRE y Vedia, 1893.

Rochdale Canals. Acts 1793, 1794, 1800, 1804, 1806–7. ROCHDALE Canal.

CANALS (PARTICULAR)—*continued.*

Rohilcund, Canal Irrigation of. Report, 1855. INDIA, p. 130.
Rostock-Berlin Navigation Canal. HESZ, 1877.
Rotterdam to the Sea. Improvement of the waterway. WELKER (J. W.), 1892.
Royal Canal Company's Affairs. DABBADIE, 1812.
Russia. Consolidation of Canal Banks. HOERSCHELMANN, 1892.
Saint Denis Canal. Reconstruction of its locks. HUMBLOT and Renaud, 1889.
St. Lawrence, Gulf of, and the Bay of Fundy. Construction of a canal between. BAIE Verte Canal, 1874.
St. Lawrence, Proposed Canal connecting the, and Lake Champlain. ST. LAWRENCE (River), 1856.
St. Louis. Canal and Port St. Louis and junction of the Rhone with the Mediterranean. BERTHAUD, 1870.
St. Martin. GIRARD (P. S.), 1820.
Sambre, Canal joining the, and the Oise. Concession. SAMBRE, 1830.
Saône and Moselle. Canal joining them. SAÔNE, 1828. Chalons to Youle. CORDIER, 1828.
Saulte Ste. Marie Canal, Improvement. ALMY (F.), 1887.
Scheldt and Lys Rivers. Their Canalisation. SCHELDT, 1837; VIFQUAIN (J. B.), 1837. Canal from Bossuyt to Courtray. VIFQUAIN (J. B.), 1838.
Scheldt and Maas. QUINETTE de Rochemont, 1870.
Schlesisch-Markische Canal. HAVESTADT (C.) and Contag, 1884.
Scotland. Survey of the different lines for a canal between Edinburgh and Glasgow. RENNIE (J.), 1797.
Sensée. Canal. CORDIER, 1820–28.
Severn and Wye Railway and Canal Bill. Minutes of Evidence. 1869. SEVERN and Wye Railway,
Sheffield to Tinsley Navigable Canal Act, 1815. SHEFFIELD Canal.
Sheffield Canal. Account of its opening, Feb. 22, 1819. SHEFFIELD Canal.
Shorncliff to Boone's Bridge on the River Rother Canal. Letter declining the offer of the contract for. RENNIE (John), 1804. Add. 530.
Shrewsbury Canal. Act for making a canal from the North end of the Shropshire Canal to the town of Shrewsbury, 1793. SHREWSBURY Canal.
Shropshire Canal. Act, 1788. SHROPSHIRE Canal.
Sidhnai Canal project in the Punjab, 1888. INDIA, p. 130.
Sind, Canal Irrigation in, 1863. INDIA, p. 131.
Sind. Management, 1853. INDIA, p. 131. Proposed Canal and Railway, 1854. INDIA, p. 131.

CANALS (PARTICULAR)—*continued.*

Sleaford Canal. Act, 1792. SLEAFORD Canal.

Soissons. GIRARD (P. S.), 1824.

Somersetshire Coal Canal. Act, 1802. SOMERSETSHIRE Canal, 1802. Letter. SUTCLIFFE (J.), 1880.

Sone Canal, 1870–74. INDIA, p. 131.

—— Anicut under the sluices, 1872. INDIA, p. 131.

—— estimates, 1867 to 1886. INDIA, p. 132.

—— Canals of Irrigation and Navigation from the River Soane, 1861. INDIA, p. 132.

—— Sone Canal project. Maps, 1861. INDIA, p. 132.

Soulanges Canal. Report on plans in connection with it. SOULANGES Canal, 1891.

Southampton and Salisbury Canal. Acts, 1795–1800. SOUTHAMPTON and Salisbury Canal.

Southern of France (formerly Canal de Languedoc). ANDREOSSY, 1799, 1803.

Spain. Canal Imperial Maritimo. CONRAD, 1834.

—— Canal de Isabel II, works in 1853. OTERO.

Staffordshire and Worcestershire Canal. Acts, 1766, '70. STAFFORDSHIRE and Worcester Canal.

Stainforth and Keadby Canal. Acts, 1793, 1798, 1809. STAINFORTH and Keadby.

Stamford Junction Canal. Misrepresentations as to the motives and proceedings of the Projectors. STAMFORD Junction Canal, 1811.

Stella to Hexham. Report on the proposed line of Navigation, etc. CHAPMAN (W.) 1797, p. 241; SUTCLIFFE (J.), 1796.

Stirling Canal. Prospectus and Report. STIRLING Canal, 1835.

Stockton and Portrack Canal. Report on the expediency of making, etc. STOCKPORT and Portrack Canal, 1805.

Stourbridge Canal. Acts for making a navigable canal from Stourbridge to join the Staffordshire and Worcestershire Canal at Stourton, 1776, '82. STOURBRIDGE Canal.

Stourbridge and Worcester Canal. Address to the public on the new intended Canal from Stourbridge to Worcester, 1786. STOURBRIDGE and Worcester Canal.

Stowmarket and Ipswich Canal. Acts for making and raising money to complete, 1790, '93. STOWMARKET and Ipswich Canal

Stratford-on-Avon Canal. Acts, 1793, 1795, 1799, 1809, 1815, 1817. STRATFORD-ON-AVON Canal.

Strathmore Canal, Report relating to. STEVENSON (R.), 1817.

Strathmore and Strathearn Valleys. Memorial regarding the propriety of opening them by means of a railway or canal. STEVENSON (R.), 1820–1821.

CANALS (PARTICULAR)—*continued.*

Strömeholm Canal and locks. SCHENSTRÖM, 1797.

Süd-West-Kanal, Berlin-Wannsee. HAVESTADT (C.) and Contag, 1883.

Swansea Canal Act, 1794. SWANSEA Canal.

Sweden, 1880. SWEDEN, p. 270.

Swedish, especially from Lake Wenern to the Baltic. PLATEN, 1806.

Tancarville, Projected canal from. ROUEN, 1880.

Tasmania. Ringarooma High level Canal scheme. RINGAROOMA River, 1885.

Tavistock Canal Act, 1803. TAVISTOCK Canal.

Terneuzen. Gand et ses installations maritimes. BRUNEEL & Braun, 1881. Canal de Terneuzen et le port de Gand. BRAUN (E.), 1885.

Thames, Canals projected for the purpose of avoiding the navigation of, 1810. KENNET and Avon. Junction on the rivers Thames and Medway. DODD, 1799.

Thames and Medway Canal Acts, 1800, 1804, 1810, 1818. THAMES and Medway Canal.

—— Gravesend, Canal from near, to Strood. DODD, 1798.

Thames and Severn Canal. Acts, 1791, 1796, 1809, 1813. THAMES and Severn Canal. Report to the Board of Trade on. THAMES and Severn Canal, 1888.

Trent. Act for making a Canal from the River Trent, through Derby, to Little Eaton, 1793. DERBY Canal.

Trent and Mersey Canal Acts, 1766, '70, '97, 1802, 1809. TRENT and Mersey Canal.

Trieste and Muggia. RIETER (H.), 1862.

Trollhätta, Sweden, description of its canal. SKJÖLDEBRAND (A. F.), 1804.

Tunbridge. Grand Southern Canal proposed between, and Portsmouth. RENNIE (J.), 1810.

Tyne River. Report on proposed canal on north side of. WHITWORTH (R.), 1797.

Ulster and Tyrone Canal Navigation Act, 1888. ULSTER and Tyrone Canal, 1888. Report from the Select Committee of the House of Lords on. ULSTER and Tyrone Canal, 1888.

Ulverston Canal Act, 1793. ULVERSTON Canal.

Union Canal. Proposed Extension from Gumbey Wharf to the Grand Junction Canal, near Buckley Wharf. Survey and Report. TELFORD (T.), 1803, p. 288.

—— Proposed Union Canal. GRAHAME (J.), 1814.

Valais Alps. BLOTNITZKY, 1871.

Venice to Spezia project. ROMANO (G. A.) and Fiandra, 1889.

Vienna-Danube. Caisson-gates. ENGERTH, 1884.

CANALS (PARTICULAR)—*continued.*

Vistula-Oder Canal. HERR, 1880.

Waltham Abbey to Moorfield. Report and Survey of the proposed Canal from. WHITWORTH (R.), 1773–4. Advantages which may be expected from the canal proposed to be made from Waltham Abbey. SHARP (J.), 1774.

Warwick and Birmingham Canal. Acts and Bill, 1793, '96, 1893. WARWICK and Birmingham Canal.

Warwick and Braunston Canal. Acts 1794 and 1796. WARWICK and Braunston Canal.

Warwick and Napton Canal Act, 1809. WARWICK and Napton Canal.

Western Union Canal. Replies of the Committee of the Thames Navigation Commissioners to arguments relating to. WESTERN Union Canal, 1820.

Wey and Arun Junction Canal Act, 1813. WEY and Arun Junction Canal.

Wilts and Berks Canal. CLEGRAM, etc., 1883. Acts 1795, 1801, '10, '13, '15; WILTS and Berks Canal.

Winchester. Proposed junction canal between, and the Basingstoke Canal. BASINGSTOKE Canal, 1808.

Wisbech Canal Act, 1794. WISBECH Canal.

Witham. Practicability of a Junction Canal between the Rivers Witham and Ancholme. PADLEY, 1828.

Worcester Canal. (Proposed.) WORCESTER Canal, 1790.

Worcester and Birmingham Canal. Acts 1791, '98, 1804, '8, '15. WORCESTER and Manchester Canal. Reasons why the Oxford, Worcester, and Wolverhampton Railway Company should not obtain control of it. WILLIAMS (E. L.), Sen., 1865.

Wyrley and Essington Canal. Plan of, as now executed, with proposed extensions for surveys taken in 1791–2–3. WYRLEY, etc., Canal. Acts 1792, '94. WYRLEY, etc., Canal.

CANALS (SHIP). GENERAL REFERENCES.

New method of laying out and working canal levels for ships' transport. MEYER (G.), 1877.

Ship Canals. CORTHELL, 1885. Improvement of, Benefits to be derived from. VERNON-Harcourt (L. F.), 1893.

Usefulness of Maritime Canals. GOBERT, 1886.

CANALS (SHIP). PARTICULAR.

American inter-oceanic. *See* ATLANTIC AND PACIFIC.

Australia (Western). Proposed Ship Canal to connect Rocky Bay, in the Swan River, with the sea. Report. WESTERN Australia, 1874.

CANALS (SHIP)—*continued.*

Austria. Ship-canal projects of the Josephine age and their adaptability to the present time. ITZELES (L.), 1882.

Belgium. GOBERT, 1884.

Birmingham. Report of Committee on proposed Ship Canal. BIRMINGHAM Ship Canal, 1888.

Bridgewater. PRICE (H. H.), 1835.

Bridgewater to Seaton, to form a junction of the English with the Bristol and Irish Channels. PYKE, 1823.

Canada Ship Channel through Lake St. Peter. Documents relating to its deepening. ST. PETER, Lake, Canada, 1853.

Corinth Marine canal. TÜRR (S.), 1886.

Darien. *See* ATLANTIC and Pacific.

English and Bristol Channels Ship Canal. Prospectus and Telford's Report. ENGLISH and Bristol, 1824; TELFORD (T.) and Nicholls, 1824. Preliminary Report and Prospectus. TELFORD (T.), 1824, p. 287. Report to Committee of Management. NICHOLLS, 1825.

Erie (Lake) and Ohio Rivers Ship Canal (projected). ROBERTS (T. P.), 1893.

Erie and Ontario Lakes. Survey around the Falls of Niagara with a view to the construction of a ship canal between. WILLIAMS (Capt. W. G.), 1836.

Forth and Clyde Ship Canal in relation to the development of Commerce. CRAWFORD (J. L.), 1891.

Guaratiba. WEBB (E. B.), 1856.

Hooghly and Mutlah Ship Canal. Official Correspondence. MOORE (Ralph), 1863.

Hudson River to Lake Champlain. Construction of a ship canal from. WEED (S. M.), 1873.

Imperial Ship Canal from London to Portsmouth. CUNDY, 1828.

—— London to Arundel Bay and Portsmouth. CUNDY, 1827.

Lowestoft to Norwich Ship Navigation. Report on the plan for making. WALKER (James), 1826, p. 394.

Manchester Ship Canal. CONDER; HAUPT (L. M.), 1894; HELM (E.), 1893. Add. 506; PULLIGNY, 1892; TIMONOFF (V. E.), 1891; VOISIN (Bey), 1888. Plans and Map. BOOTH (W. F.), 1884. Report, 1891. MONRO (T.). Canal Works. PLATT (S. S.), 1889. Committee of House of Commons on Bill. CUNNINGHAM (D.), 1885. Reply on behalf of the promoters of, before the Select Committee of the House of Lords, 1884. PEMBER (E. A.). Add. 527. Press on the question, 1882. Why it is wanted, 1882. Legal considerations, 1882. Engineers' Reports, 1882. Report of Provisional Committee, 1882. Minutes of evidence, 1883–85. Description of the project, 1884. MANCHESTER Ship Canal.

CANALS (SHIP)—*continued.*

Manchester and Dee Ship Canal. CHAPMAN (W.), 1825, p. 242.

Melbourne Ship Canal or Tidal Harbour and Docks. MILLAR (John), 1860.

Newcastle, ship canal and railway from, to Carlisle. CHAPMAN (W.), 1824, pp. 241, 242.

Niagara Ship Canal. From the West and North-West to the Sea. JUDSON, 1890. Report, 1888. NIAGARA.

Nicaragua. *See* ATLANTIC and Pacific.

North Sea, ship canal uniting the, with the Baltic. SABATINI (D.), 1859.

Panama. *See* ATLANTIC and Pacific.

Quebec and Montreal, Report of the further deepening of the Ship Canal between. NISH, 1872

Suez Canal. BATEMAN (J. F. la T.), 1870; BOREL, 1867–68; CLARKSON (E.), 1843; DESPLACES, 1858; FONTANE and Riou, 1869; FOWLER (Sir J.), 1869; KENNEY, 1857; MATI, 1870; MONTEIL, 1874; MONTESINO, 1857; PAPONOT, 1889. Report. RICHARDS (Admiral Sir G. H.) and Clarke, 1870.

—— Practicability of opening a communication between Red Sea and the Mediterranean by a Ship Canal through the Isthmus of Suez. ANDERSON (A.), 1843.

—— Mediterranean and Red Seas. Inquiry into the means of establishing a Ship Navigation between. VETCH (J.), 1843.

—— Block on. HAUGHTON (B.), 1884. "Bulletin." PERIODICAL PUBLICATIONS, 13. Canal Question viewed in a Cobdenian sense. HADDAN (J. L.), 1873. Chart. PHILIP (G.), 1876. Suez Canal Conference, 1867. RITT (O.). History of the Isthmus of Suez. RITT (O.), 1869. Suez Canals from the most ancient times. GROVER (J. W.), 1877. Suez, early history. PRICE (J. S.), 1883. Suez Canal. Memoir, 1869, 1869–1884 NOURSE. Menzaleh and Ballah Lakes. BADOIS, 1865. Navigation by night, NANSOUTY, 1886. Political, engineering, and financial history. FITZGERALD (P.), 1876.

—— Letter in reply to M. de Negrelli. STEPHENSON (R.), 1858. Political bearings of Canal question. LANGE (D. A.), 1859.

—— Lord Palmerston and the Canal. LANGE (D. A.), 1857.

—— Port Said. CIALDI, 1872; PALÉOCAPA, 1868. Present and future. STEELE (J.), 1875.

—— Port Said. CIALDI, 1869, 1870, 1888, pp. 254, 255.

—— Suez Channels and Port Said. CIALDI, 1870.

CANALS (SHIP)--*continued.*

Suez Canal. Report and Plan, 1857. INTERNATIONAL Scientific Commission. Report to the Egyptian Government. HAWKSHAW, 1863. Report. LOGIN, 1870. Scientific Commission on the piercing of the Isthmus of Suez. PALÉOCAPA, 1857. Technical and economical questions. BARRAULT, 1856. Question du tracé. BARRAULT (A. and E.), 1856.

—— True position of the Suez Canal. PARKER-RHODES, 1883. Works. BADGER, 1862; LAVALLEY, 1866–69; POIRÉE, 1865.

—— Compagnie Universelle du Canal Maritime de Suez. Rapport, 1863. HAWKSHAW, p. 27.

—— Finance. Canal Company. Correspondence. Extracts from papers, Geological notice, Reports. Shipping returns, etc., relating to it. SUEZ Canal, 1860–89.

—— Correspondence, History, Letters, Reports, Documents, etc., 1855–76. LESSEPS (F. DE).

—— Suez Universal Maritime Canal Company. Actes Constitutifs, 1866. Rules for Navigation. 1869. LESSEPS (F. DE).

—— Suez Canal and Euphrates Railway. GRIFFITH (C. D.), 1857.

Tehuantepec. *See* ATLANTIC and Pacific.

Western Ship Canal Bill, 1825. WESTERN Ship Canal, 1825.

Wivenhoe to Colchester, proposition for construction. BRUFF (P.), 1842.

CANALS (CANAL BOATS).

Act for the Registration of boats, barges, &c., used on inland navigation, 1795. PARLIAMENTARY..Papers, p. 468.

Canal Boats Act, 1877. Regulations by Local Government Board. PARLIAMENTARY..Papers, p. 468.

Canal Boats Act, 1877. Amendment Bill. Report of Select Committee, 1884. PARLIAMENTARY..Papers, p. 469.

Canal and River Boats, Experimental researches on the form of. MAS (F. B. de), 1893. Add. 519.

Chain Towage. DUPUY de Lôme, 1883; LABROUSSE, 1866.

Electric Propulsion on Canals. BÜSSER (O.), 1893. Add. 489.

Electric Towage. BÜSSER, 1892.

Fulton's plan of wheel boats, and the utility of subterraneous and of small canals. CHAPMAN (W.), 1797, p. 241.

Hydraulic Motors. Aisne and Marne Canal. Use of hydraulic motors. GÉRARDIN, 1872.

Steam Canal Navigation, advantages of the use of steam. FAIRBAIRN (Sir W.), 1831, p. 402.

—— Canal Navigation by Steam. Report of Committee. NEW YORK STATE, 1858.

—— Practicability of employing steam power on Canals. LIVIUS, 1842.

CANALS (STEAM AND OTHER POWER ON).
Steam Canal Navigation. Steam for Canal boat propulsion. BAILEY (W. H.), 1886.
—— Steam Towage by means of a submerged wire cable. NEW YORK STATE, 1871.
—— Steam Towing by means of a submerged cable. MEYER (F. J.) and Wernigh, 1876.
—— Steam traction on Rivers and Canals. BUQUET, 1868.
Traction of Boats on Canalised Rivers. Towage by chain or by steam-tugs. MOLINOS & Bovet, 1892.
—— Cable Towage on Canals and Rivers. Hydraulic Canal Lift at Fontinettes. Navigation of the Seine. Pneumatic Foundations at Genoa, etc. WATSON (William), 1893.
United States. Report of the Commission on Steam on the Canals. UNITED States, 1872–4, p. 341.

CANALS (CANAL LIFTS AND INCLINED PLANES).
Canal Lifts. HIRSCH, 1881.
Hydraulic Lift and inclined plane. MALLET (A.), 1891.
Lifts and Inclined Planes for Vessels. CADART, 1889.
Inclined plane for boats. FLAMANT, 1890.
Anderton Hydraulic canal lift, accident. CADART (A.), 1882; CLARK (E.), 1882.
Belgium. Hydraulic Lift at La Louvière on the Canal du Centre. CLARK (E.), Standfield & Clark, 1889.
France. Hydraulic lift at Fontinettes on the Neuffossé Canal. CLARK (E.), Standfield & Clark, 1888; GRUSON, 1889.
Monkland Canal, Blackhill, near Glasgow. Inclined plane. LESLIE (J.), 1852.
Worcester and Birmingham Canal. Description of a patent lift erected on it at Tardebig. SMITH (E.), Notary public, 1810.

CANALS. *See also* INLAND Navigation.

CANDLES. BEVAN (G. P.), Industries, vol. iv.

CAPILLARITY, Theory of. MATHIEU, 1883.

CAPITAL. *See* LABOUR,

CAPSTAN. PHILLIPS (C.), 1820.

CARBOLIC ACID. READWIN, 1870.

CARBON AND COMPOUNDS OF CARBON. BARFF, 1874.
Carbon in Iron. *See* IRON.

CARDAN JOINT. New mode of overcoming the irregularities of motion. TRESCA, 1862.

CARPENTRY. Emy, 1837, 1869. Thomason Civil Engineering College, 1862–4.
Carpenter and Joiner's Assistant. Newlands, 1869, '80.
Carpenter's New Guide. Nicholson (P.), 1801.
Chapters of British Carpentry. Morris (T.), 1871.
Circular Work in. Collings, 1886.
Elementary principles. Tredgold (T.), 1840, 1870–1875.
Joinery. Tredgold (T.), 1820.
Manuel du Charpentier. Hanus, P. A., & Biston, 1829.
Plans, sections, and elevations of productions of the Art of the Carpenter. Krafft, 1805.
Practical Carpentry, joinery and cabinet-making. Anonymous, 1826, p. 52.
Stable equilibrium of Carpentry in iron and wood. Cordier, 1872.

CARPETS. Bevan (G. P.), Industries, vol. vi.

CARRIAGES AND CARRIAGE BUILDING.
Brakes. Philipson (W.), 1888.
Draught. Philipson (W.), 1885.
Draught and its destructive effect on roads. Morin, 1842, p. 375.
English Pleasure Carriages. Adams, W. B., 1837.
Experiments on wheel Carriages. Bourn (D.), 1763; Bourn, App. 549; Cook (J.), 1817; Edgeworth, 1813, 1816; Jacob (Joseph), 1773; Rankine (D.), 1828; Rowe (Jacob), 1734.
Harness and prices. Felton (W.), 1794. New method of constructing wheel carriages. Koster, 1819.
Movable rails on all roads, fields, wastes, etc. Boüyn, 1874.
New Plan of building Inversable Carriages. March (J.), 1785. App. 567.
Public Carriages of Great Britain. Bradfield, 1855.
Suspension of Carriages. Philipson (W.), 1889.
Utility and Advantages of Broad High Wheel Carriages demonstrated. Wickham (M.), 1755. App. 581.
Wheels and Springs of Carriages, draft of Cattle. Gilbert (D.), 1825.
See also Coaches, Railways (Rolling Stock).

CARRIERS. Select Committee on the General Carriers Act, 1877. Parliamentary..Papers, p. 469.

CASES. *See* Law Cases.

CASK-CLEANSING. Cask cleansing and purifying process. DAVISON and Symington.

CASTING. Casting and Founding, treatise. SPRETSON (N. E.), 1878, 1883.
Moulder's and Founder's Guide. OVERMAN, 1870, 1886.
Moulder's Ready Reckoner. NEAVE.

CASTINGS (CENTRIFUGAL). ANONYMOUS, 1883, p. 42.

CATALOGUES OF BOOKS. BOHN (H. G.), 1841, 1847; DULAU and Co., 1845; QUARITCH, 1864, 1875–77, 1880.
American Catalogue of Books. ANONYMOUS, 1856, p. 40.
American Library Association. Catalogue of 5,000 vols. for a popular library. AMERICAN Library Assoc., 1893. Add. 480.
Catalogue of Books and MSS. on languages and the study of Oriental literature. MARSDEN (W.), 1827.

CATALOGUES OF LIBRARIES. Construction. JEWETT, 1853; SURVEYOR'S Inst., 1894.
Rules for a Dictionary Catalogue. CUTTER (C. A.), 1889.

Aachen. K. technische Hochschule. AIX, 1879.
Aberdeen Mechanics' Institution. ABERDEEN, 1854.
Admiralty. ADMIRALTY, 1858, 1875.
Architektenverein zu Berlin. BERLIN, 1887.
Asociación de Ingenieros Industriales. BARCELONA, 1891.
Athenæum. ATHENÆUM Club, 1845–66.
Barrow-in-Furness Free Public Library. BARROW-in-Furness, 1885.
Berlin. Königliche technische Hochschule. BERLIN, 1885.
Board of Trade. BOARD of Trade, 1866.
Boston, Mass. Public Libraries. BOSTON, 1858, 1861, 1866.
British Museum Library, on the printing of Catalogue. GARNETT (R.), 1882.
Brooklyn Library. BROOKLYN, 1877.
Bruxelles. Académie Royale des Sciences et Belles lettres, 1842. ACADÉMIE Royale.
—— Baron de Stassart, 1863. ACADÉMIE Royale.
Buenos Aires. National Library. BUENOS AYRES, 1893.
California University. Contents Index of the Library. CALIFORNIA University, 1889–90.
Camera Club. Catalogue of Photographic Library. CAMERA Club, 1893.

CATALOGUES OF LIBRARIES—*continued.*

Chemical Society. CHEMICAL S., 1869, 1886.

Cherbourg. Société des Sciences Naturelles. CHERBOURG, 1852, 1870.

Clockmakers' Company Library. CLOCKMAKERS' Company, 1830. CLOCKMAKERS' Company, 1830. App., 552.

Engineers' and Shipbuilders' Institution in Scotland. Catalogue of the Library. ENGINEERS, 1885.

Engineers' Society of Western Pennsylvania. Index to the Library. ENGINEERS, 1883.

Franklin Institute, 1851. FRANKLIN Institute.

Franklin Institute. Memorial Library of International Electrical Exhibition. FRANKLIN Institute.

Freiberg. Königlich-Sächsische Bergakademie, 1879. KONIGLICH Sächsische Bergakad.

French Protestant Hospital. FRENCH Protestant Hospital, 1887.

Geological Society. GEOLOGICAL Society.

Geologists' Association. GEOLOGISTS' Assoc., 1879.

Grosvenor Gallery Library. English Works, Foreign Works and Music. GROSVENOR Gallery, 1884.

Guildhall Library of the Corporation of London. GUILDHALL, 1859, '89.

—— Works of Art. GUILDHALL, 1867–8.

Hanover. Architekten- und Ingenieur-verein. HANOVER, 1866, 1876–85.

—— Polytechnische Schule. HANOVER, 1868.

—— Königliche technische Hochschule. HANOVER, 1893.

House of Commons. COMMONS, p. 284.

Incorporated Law Society. Catalogue of Printed Books in the Library. INCORPORATED Law, 1891.

Institution of Mechanical Engineers, 1881, 1887. INSTITUTION of M. E.

Leeds. LEEDS, 1878, p. 226.

Liége. Association des Ingénieurs. LIÉGE, 1894.

Manchester Free Libraries. Annual Reports, 1854, etc. Catalogue of the Reference Department, 1864–81. MANCHESTER.

—— Mechanics' Institution. Catalogue of the Library. MANCHESTER, 1834.

Melbourne. Public Library. MELBOURNE, 1861, '80.

Museum of Practical Geology. GEOLOGICAL Survey, 1878.

Patent Office. COMMISSIONERS, p. 283.

Peabody Institute. PEABODY, 1883–92.

Pennsylvania University. PENNSYLVANIA University, 1885.

Radcliffe Library, Oxford. Catalogue of Books, 1881. Catalogue of Transactions, etc. RADCLIFFE Library, 1882, 1887.

CATALOGUES OF LIBRARIES—*continued.*

Royal Engineers. Catalogues of the different libraries of the Corps of the Royal Engineers.
ROYAL Engineers, 1859, 1866, 1876.

Royal Engineers Corps Library at Whitehall. Catalogue.
VETCH (Lt. Col. R. H.) and Day, 1885.

Royal Engineers' professional library at Dublin.
ROYAL Engineers, Dublin, 1856 and 1866.

Royal Geographical Society. ROYAL Geographical Soc., 1852.

Royal Irish Academy Museum. Descriptive Catalogue of the Antiquities of stone, earthen, and vegetable materials.
WILDE (W. R.), 1857.

St. Helens. Free Library Catalogue of Books.
ST. HELENS, 1882.

Schweizerische Polytechnikum. SCHWEIZERISCHES, 1866.

Smithsonian Institution. Library Catalogue of publications of Learned Societies and journals possessed by them.
SMITHSONIAN Institution, 1855.

South Kensington Museum. Catalogue.
SOUTH Kensington Museum, 1891.

Surveyors' Institution. Library Catalogues.
SURVEYORS' INST., 1874, '83, '93.

—— Collection of works on Forestry. Catalogue.
SURVEYORS' Institution, 1894

Thomason Civil Engineering Coll. Central Library Catalogue.
THOMASON Civil Engineering Coll., 1863, '69.

United States Congress. Catalogue of the Library.
UNITED States, 1864–72, p. 343.

United States. Index Catalogue to the Library of the Surgeon General's Office. UNITED STATES, 1880, etc., p. 357.

War Office, Whitehall. ROYAL Engineers, 1885.

Washington College, Lexington, Va. Catalogue.
WASHINGTON Coll., 1868.

Wigan Free Public Library. Index Catalogue of Books and Papers relating to Mining, Metallurgy, and Manufactures.
WIGAN, 1880.

York Gate Geographical and Colonial Library Catalogue.
SILVER (S. W.), 1882.

See also MUSEUMS.

CATALOGUES (VARIOUS).

Annual Exhibitions of Instruments.
ROYAL Meteorological Soc., 1886–92.

Antiquities and Works of Art exhibited at Ironmongers' Hall in May, 1861. IRONMONGERS' Hall.

Antiquities found in the excavations at the New Royal Exchange.
TITE (W.), 1848.

CATALOGUES (VARIOUS)—*continued.*

Arms and Armour, European and Oriental, 15th to 18th centuries. HENRY, 1886.

Canada. Catalogue of a collection of the economic minerals. CANADA, 1886, p. 216.

—— Catalogue of a stratigraphical collection of Canadian Rocks. CANADA, 1893, p. 216.

—— Catalogue of Canadian plants. CANADA, 1884, p. 216.

—— Catalogues of economic minerals. CANADA, 1862, 1876, 1893, p. 217.

—— Catalogue of the Silurian fossils of the Island of Anticosti. CANADA, 1866, p. 217.

Charts, plans, sailing directions, etc. ADMIRALTY, 1858.

Manuscripts. Cottonian MSS. BRITISH Museum, 1802.

—— Harleian MSS. BRITISH Museum, 1808–12.

—— Lansdowne MSS. BRITISH Museum, 1808–12.

Minerals, rocks, fossils, etc., collected by the Mining Department, Victoria. VICTORIA, 1866–69, p. 376.

Models. Geological, Mining, and Metallurgical Models. GEOLOGICAL Survey, 1865.

Paintings, books, bronzes, etc., at Mytton Hall. HICK, 1893.

Pictures. BRETT Collection, 1864.

—— London. Bridgewater House. BRIDGEWATER Collection, 1851.

—— Norton Hall. BOTFIELD, 1848.

Portraits of Inventors, Discoverers of Useful Arts. COMMISSIONERS, p. 283.

—— Royal Society Portraits. WELD (C. R.), 1860.

CATTLE.

Labour of, in draught. CUMMING, 1809.

Mode of ascertaining their weight. HUART, 1836.

Mode of finding the weight of cattle. BELGIUM, 1836, p. 116.

Sheep and Swine. Report. GORDON (C.), 1883.

CATTLE MARKETS.

Buda-Pest. HENNICKE and Hude, 1873.

London. Change of market day with regard to the Lord's Day. PEARSON (C.), 1855.

—— New Central, moral and sanitary aspects of. BUSHNAN, 1851.

France. Cattle markets of small towns. THOMAS (Ernest), 1873.

Germany, France, Belgium, Italy, England and Switzerland. HENNICKE (J.), 1866.

CEILINGS. Application of linear perspective to the architectural decoration of. BAILBY, 1876.

CEMENTS.

Application of soluble alkaline silicates. KUHLMANN, 1858.

Barcelona, Cement used in the harbour of. LOPEZ (A.) y Ca., 1884.

Béton aggloméré or Coignet-béton and the materials of which it is made. GILLMORE (Q. A), 1874.

Calcareous Cements. HIGGINS (B.), 1780. Proper materials for their manufacture. VICAT (L. J.), 1828. Calcareous Mortars and Cement, artificial and natural. Treatise. VICAT (L. J.), 1837.

Cements. AUSTIN (J. G.), 1862; CLERICETTI, 1871; DYCKERHOFF, 1881; FERET, 1890, '91; SCOTT (Capt. H.), 1861–2; THOMASON Civil Engineering Coll., 1862–4.

Cements and Cement Mortars, Permeability of. HYDE (G. W.) and Smith, 1889.

Cements and hydraulic limes. Their different properties from incomplete dressing examined. VICAT (L. J.), 1840.

Examination of Cement. MICHAELIS (W.), 1876.

Experiments. CLERICETTI, 1871.

France, 1890. FRANCE, p. 437.

Genoa, Cements used in the works of the port of. LUIGGI and Cardi, 1893. Add. 517.

Germany. Cement Industry. DELBRÜCK, 1885.

Hydraulic cement. CANDLOT, 1891; HUNT (A. E.), 1891.

La Valentine. MICHEL & Co., 1860.

Lime and Cement. MERCERON-VICAT, 1885.

Limes, Calcareous Cements, Mortars, Stucco and Concrete. PASLEY, 1838, 1847.

Limes, Hydraulic Cements, and Mortars. GILLMORE (Q. A.), 1870.

Manual of Cement. HEATH (A. H.), 1893.

Manufacture at Vassy-lès-Avalon (Yonne) constructions. GARIEL, 1853.

Manufacture of Cements. BONAMMI, 1888.

Method of compounding a cement or mortar suitable for a large number of works. LORIOT, 1774.

Natural and Artificial. REID (H.), 1879.

Natural Water Cements of England and Artificial Cements. PASLEY, 1830.

Patent Selenitic Cement Company. SCOTT (Maj.-Gen. H. Y. D.), 1874.

Permeability of Cements. DURAND CLAYE and Debray, 1889.

Practical remarks on Cements. ANONYMOUS, 1832, p. 52.

Properties of cement. LE CHATELIER (H.), 1889.

Pozzolana. SCHUMANN (C.), 1886. Purchase and use of the patent English Pozzolane for building and stucco work. JEARRARD, 1824.

CEMENTS—*continued.*

Pozzolana. Researches on Pozzuolana.
FAUJAS DE SAINT FOND (B.), 1778. Add. 500.

—— Treatise on the composition. VICAT (L. J.), 1856.

—— Artificial Pozzolana compared with Italian Pozzolana in their employment in fresh and salt water. VICAT (L. J.), 1846.

Right of using oil cement or composition for stucco.
ANONYMOUS, 1778, p. 40.

Rudimentary treatise. BURNELL, 1850.

Spain. Cement made in the Vascongadas Provinces.
CERERO, 1871.

See also KILNS; LIMES.

CEMENTS (PORTLAND CEMENT) ANONYMOUS, 1887, p. 49; BARREAU, 1881; CANDLOT, 1886; COLLINS (D. L.), 1888; DIETRICH, 1885; MICHAELIS (W.), 1869, '82, '88; Report, LE CHATELIER, 1889; MIDDLETON (R. E.), 1882; MOUNTAIN, 1885; REID (H.), 1878.

Building under water. AMMANN, 1894. Add. 481.

Hardening in water and in air. PERRODIL, 1884.

Magnesia in Portland Cement. ERDMENGER, 1893, and Add. 499; MICHAELIS (W.), 1887, '88.

Manufacture. REID (H.), 1868, 1877. Portland cement and concrete use. COX (S. F.), 1881. Adulterations of. FRESENIUS, 1885. Application to marine works. STONEY (B. B.), 1871. Composition and value. MERCHANT, 1880. Some of its uses. BERNAYS (E. A.), 1879.

—— Experience of chemical analysis in relation to quality in the manufacture. COLLINS (D. L.), 1880.

—— Improvements in the manufacture of.
RANSOME (F.), 1887. Add. 530.

—— Used in the southern main drainage works (London), strength. GRANT (J.), 1875.

—— Manufacture and testing. FAIJA, 1893.

—— For users. FAIJA, 1881.

Notes on recent additions to our knowledge.
GRIFFITH (J. P.), 1894. Add. 504.

Portland and Roman Cement. SCHAFHÄUTL (C.), 1851.

Strength of Roman and Portland Cements. Experiments.
WHITE (John B.), 1852.

Strength of Cements. Rules for the testing of Portland Cement.
ANONYMOUS, 1885, p. 53.

Testing Laboratory, Gothenburg. WIJKANDER and Wallin, 1894.

Testing of Portland Cement. UNWIN (W. C.), 1886, p. 360.

—— Kurrachee. PRICE (W. H.), 1873.

United States. History of the Portland Cement Industry.
UNITED States, 1892, p. 355.

CEMETERIES (LONDON). Establishment of a place of extramural sepulture. HAYWOOD (W.), 1853, p. 30.
City of London Cemetery at Ilford. Reports. HAYWOOD (W.), 1855, '56, p. 30.
Modern Tombs. Gleanings from public cemeteries. HAKEWILL, 1849.
Sutton (Surrey). Long Gallop and Rose Hill Park, Proposed Cemeteries at. SUTTON, 1886. Add. 535.
Turin general cemetery. PRINETTI, 1888.

CENSUS, *see* POPULATION.

CENTRIFUGAL ACTION in practical work. LAIDLAW, 1891.

CHAIN CABLES. Act for regulating the proving and sale of chain cables and anchors, 1864. Reports from Select Committees, 1864–74. PARLIAMENTARY . . Papers, p. 469.
Chain Cables and Chains. TRAILL (T. W.), 1885.
Chain haulage on inclines at the Iron Mines of Dicido, Santander. BRÜLL, 1884.
Durand's patent for an improvement in the manufacture. CURTIS (J. G. C.), 1861.
Specification of Chain Cables, Mooring Chains. ADMIRALTY, 1888. Observations. BRUNTON, Middleton and Co., 1815. Chain Cable Testing. PEACOCK (R. A.), 1862.
Stability of Chains. HARTIG, 1892.
Use of chains for lifting and hauling. ADAMS (H.), 1887.

CHAINS, BICYCLE.
Index to the various kinds of steel chains. RENOLD (H.), 1893.
Minute oscillations of a uniform flexible chain. SANG (E.), 1887.

CHALK.
Red Chalk of England. WILTSHIRE (Rev. T.), 1859.

CHARCOAL.
Charcoal Burners' Handbook. SVEDELIUS (G.), 1875.

CHARITABLE TRUSTS ACTS. Report from Select Committee, 1884. PARLIAMENTARY . . . Papers p. 469.

CHARITIES OF LONDON, 1863, etc. Low (S.)

CHARITY, FRANCE. History of Public Charity in France. JOHNSTON (D.), 1829.

CHARTERED COMPANIES.
Reports relating to the East India Company. EAST India Company 1804–6. Add. 498.

CHARTS. *See* MAPS.

CHEMISTRY. Treatises. BERZELIUS, 1808–12, 1835, 1845: BRANDE, 1819, 1848. CAVENDISH Society Handbook. GMELIN, 1848–72. Lectures. DAVY (Sir H.), Works, vol. 2. Elements. FOWNES (G.), 1859; GALLOWAY (R.), 1851; GRAHAM and Watts, 1850–58; JULLIEN (C. E.), 1867; KUHLMANN, 1847; LIEBIG, 1851; MILLER (W. A.), 1867–69; ROSCOE (Sir H. E.), 1877; ROSCOE (Sir H. E.) and Schorlemmer, 1878–92; SCHOEDLER (F.), 1851; TURNER (Dr. E.), 1840; WILLIAMSON (A. W.), 1873. Chemistry of Common Life. JOHNSTON (J. F. W.), 1855. Modern Chemistry. ERNI, 1885. Modern Theories. MEYER (L.), 1888.

Acetous Acid, fixable air, oils, fuel, &c. HIGGINS (B.), 1786.

Acids and Alkalies. BEVAN (G. P.), Industries, vol. 4.

Agricultural Chemistry. *See* AGRICULTURE.

Alkalimetry, commercial value of Acids and Manganese. FRESENIUS and Will, 1843.

Annalen der Physik und Chemie. PERIODICAL PUBLICATIONS, p. 9.

Annales de Chimie et de Physique. PERIODICAL PUBLICATIONS, p. 9.

Annals of Electricity, Magnetism, and Chemistry. PERIODICAL PUBLICATIONS, p. 11.

Annual Reports on the Progress of Chemistry, 1847–50. LIEBIG and Kopp.

Analytical Chemistry, a treatise. ROSE (H.), 1859–62.

—— Chemical Analysis (chiefly inorganic). CROOKES, 1886.

Atomic weights of simple bodies. BERZELIUS, 1835.

Bibliography, 1492–1892. BOLTON (H. C.).

Blow-Pipe Analysis. LANDAUER, 1879.

Candle, Chemical History of a. FARADAY (M.), 1861.

Carbonic Acid, quantity of carbon in. ALLEN, W., and PEPYS.

Chemical Affinity, Electricity, and Magnetism, illustrated by a noiseless Dynamo requiring no steam power. ROSS (O. C. D.), 1891.

Chemical Department of Owens College, work done in the, 1857–87. ROSCOE (Sir H. E.), 1887.

Chemical Dynamics. HOFF (J. H. Van 't), 1884.

Chemical Equilibrium the result of the Dissipation of Energy. LIVEING, 1885.

Chemical Equilibrium. LE CHATELIER (H.), 1888; LE CHATELIER (H.), and Mouret, 1891.

Chemical Forces, connexion of, with the Polarization of Light. MASKELYNE, 1841.

Chemical Gazette. PERIODICAL PUBLICATIONS, 13.

Chemical Laboratories. K. rheinisch - westphälische polytechnische Schule. AIX, 1879.

CHEMISTRY—*continued.*

Chemical Laboratories. Bonn and Berlin. HOFMANN, 1866.
—— School of Military Engineering, Chatham. ABNEY, 1888.
Chemical Manipulation. FARADAY (M.), 1842; NOAD, 1857; VOILETTE (H.), 1839.
Chemical Method; notation, classification and nomenclature. LAURENT (A.), 1854.
Chemical News and Journal of Physical Science. PERIODICAL PUBLICATIONS, p. 13.
Chemical Philosophy. DAVY (Sir H.), Works, vol. 4. DALTON, 1827, 1842; DANIELL, 1839.
Chemical Reports and Memoirs. GRAHAM (T.), 1848.
Chemical Statics. DUMAS and Boussingault, 1844.
Chemical Technology, 1879–88. WAGNER (R. von).
Chemico-technical analysis. POST (J.), 1882.
Chemist. PERIODICAL PUBLICATIONS, p. 13.
Chemistry applied to Arts and Manufactures. ANONYMOUS, p. 42; MUSPRATT (J. S.), 1860; CHAPTAL, 1807; DUMAS (J. B.), 1828–46.
Coal Tar and Ammonia. LUNGE, 1887
Coal Tar Industry: Recent Progress. ROSCOE (Sir H. E.), 1886.
Destructive Distillation, paraffin, coal tar, rosin oil, petroleum, and kindred industries. MILLS (E. J.), 1877.
Dictionary. AIKIN (A. and C. R.), 1807–14; LIEBIG, Poggendorff and Wohler, 1857–64; URE (A.) 1828; WATTS (H.), 1866–81, 1888–94.
Dictionary of Applied Chemistry. THORPE (T. E.), 1890–93.
Distillation of Coal Tar and Ammoniacal Liquor. LUNGE, 1882.
Engineering, Relation of Chemistry to. ARMSTRONG (H. E.), 1887; DURAND CLAYE (C. L.), 1885.
Ethane, a new. BOMANJI Sorabji.
Fusibility of isomorphous mixtures of some double carbonates. LE CHATELIER, 1894. Add. 515.
Fusibility of isomorphous saline mixtures. LE CHATELIER, 1894. Add. 515.
General, Analytical and Applied. JAGNAUX, 1887.
Hydrologique, Chimie, LEFORT, 1859.
Industrial Chemistry. JULLIEN (C. E.), 1866; PAYEN, 1878.
Inorganic. RICHTER (V.), 1878.
Inorganic and Organic. TIDY (C. M.), 1878, 1887; BLOXAM (C. L.), 1867.
Inorganic Chemistry. Elements. SHEPARD (J. H.), 1886.
Inorganic Chemistry. Introduction. MILLER (W. A.) 1871.
Journal of Natural Philosophy, Chemistry, etc. PERIODICAL PUBLICATIONS, p. 18.

CHEMISTRY—*continued.*

Metallic Borates. LE CHATELIER (H.), 1891.
Microscopic Salt, acids, bases and water. DALTON, 1840–42.
Nitrous oxide and its respiration. DAVY (Sir H.), Works, vol. 3.
Non-Metallic Elements. FARADAY (M.), 1853; GUTHRIE (F.), 1868.
Organic Bodies: Vegetables. THOMSON (J.), 1838.
Perchloride of Iron as a deodorizing agent. MILLER, Hoffman and Frankland, 1860.
Phenic Acid. LEMAIRE, 1865.
Phosphate of Lime. Nature and origin of deposits. PENROSE (R. A. F.), Jr., 1888.
Phosphates of America and the manufacture of sulphuric acid. WYATT (F.), 1892.
Physico-chemical forces. BECQUEREL (A. E.), 1875.
Physiological Chemistry, Apparatus for. BRUNTON (T. L.), 1879; CAVENDISH Society; Atlas, FUNKE, 1853; LEHMANN, 1851–54.
Pigments. Chemistry of. THOMSON (John M.), 1885.
Practical Chemistry. Qualitative Analyses. HARCOURT, A. G. V. and Madan, 1872.
—— Chemistry, practical and theoretical. ROBIN (E.), 1842.
Progress. RÜDORFF, 1887.
Pure and applied Chemistry. Dictionary. WURTZ (A.), 1874–8.
Pure and technical. GOTTLIEB, 1861.
Pure, applied, and physical. FRANKLAND (E.), 1877.
Putrefaction and Antisepsis, Chemistry of substances taking part in. THOMSON (John M.), 1887.
Pyrology or fire chemistry. ROSS (Lt.-Col. W. A.), 1872, 1875.
Quartz, expansion of. LE CHATELIER (H.), 1889.
Qualitative Chemical Analysis. Course. VALENTIN (W. G.), 1884.
Quantitative Chemical Analysis. FRESENIUS, 1865, 1876.
Reagents. PAYEN and Chevalier, 1822.
Relation of Chemistry to Engineering. ARMSTRONG (H. E.), 1887.
Retrospect of Chemical Discoveries. PERIODICAL PUBLICATIONS, p. 23.
Revenue in jeopardy from spurious chemistry demonstrated in researches upon wood spirit and vinous spirit. URE (A.), 1843.
Salts, on the fusibility of mixtures of. LE CHATELIER (H.), 1894. Add. 515.
—— Mutual Solubility of. LE CHATELIER (H.), 1894. Add. 515.
Scientific Chemistry. Introduction. BARFF, 1872.
Silica, expansion of. LE CHATELIER (H.), 1890.

CHEMISTRY—*continued.*

Solubilities of chemical substances. STORER (F. H.), 1864.

—— General Laws of the solubility of normal bodies. LE CHATELIER (H.), 1894. Add. 515.

Sulphuric Acid, Manufacture of. HAMMOND (John), 1878; LUNGE, 1879–80.

Superphosphates. Double and triple. LAZARUS, 1894. Add. 514.

Tables for qualitative analysis. COOKE (S.), 1876.

Tables of Chemical Constants. JOHNSTON (J. F. W.), 1834.

Technical Chemistry (Science Lectures at South Kensington). ROSCOE (Sir H. E.), 1879; SCHUBARTH (E. L.), 1851.

—— Chemical Technology. GROVES and Thorpe, 1889; KNAPP, 1848. (Acids, alkalies and salts: their manufacture). RICHARDSON (Thomas) and Watts, 1863–5. Handbook, WAGNER (R. von), 1872.

Theology, Natural, Chemistry, Meteorology, and the functions of digestion considered with reference to. BRIDGEWATER Treatises, 8.

United States Geological Survey (Chemistry Division). Report of the work done in 1884–90. CLARKE (F. W.), 1891-2 and 1892–3; CLARKE (F. W.), 1893. Add. 492.

Volumetric Analysis, systematic handbook. SUTTON (F.), 1863, '90.

CHESS. Magic square of the knight's march. BEVERLEY (W.), 1848.

See also AUTOMATA.

CHILDREN. Commission on work of, in Manufactures, Mines, and Workshops. DUPIN, 1840.

Condition and treatment of, employed in the Mines and Collieries of the United Kingdom. ANONYMOUS, 1842, p. 42.

—— Employment in Mines. Report of Parliamentary Commission, 1842. PARLIAMENTARY..Papers, p. 471.

Notes on the development of a child. SHINN (M. W.), 1893.

CHIMNEYS.

Boiler and factory Chimneys, their draught, power and stability. WILSON (Robert), 187[illegible]

Chimney Draught. THURSTON (R. H.), 1890, p. 308.

Chimneys for furnaces, fireplaces, and steam boilers. ARMSTRONG, R. (1866).

Construction. CLAVERING, 1779; HIORT (J. W.), 1826.

—— New plan of constructing. CAUTY, 1775; GENNETÉ, 1760.

Factory, furnace, and other tall Chimney Shafts, Designs. RAWLINSON (Sir R.), 1858.

CHIMNEYS—*continued.*

Masonry, Chimneys in, construction and stability. BRAET (G.), 1885.

Mechanism of Fire made in Chimneys. GAUGER, 1716.

Patent metallic lining and damper for Chimneys. SMITH (Seth), 1831.

Tall Chimney Construction. BANCROFT, 1883, 1885.

Treatise on. ECKSTEIN, 1852.

CHOLERA. *See* EPIDEMICS.

CHRONOLOGY. Maya Year, 1894. THOMAS (Cyrus), 1894. Add. 536.

Reform of the Calendar. Speech on the Bill for regulating the commencement of the Year. MACCLESFIELD, 1751.

Perpetual Calendar. COLLIGNON (E.), 1890.

Remarks on the solar and lunar years. MACCLESFIELD, 1751; MACCLESFIELD, 1751. App. 567.

CHRONOLOGY (METRICAL). HOWLETT, 1855.

CHRONOMETERS. *See* CLOCKS and Watches.

CHURCH OF ENGLAND. London Church Building, 1855. LONDON Diocesan C.B.S., p. 280.

CHURCH OF SCOTLAND.

Scotland Report on the petition of the Commissioners for the General Assembly of the Church of Scotland. SCOTLAND, 1803, p. 174.

CIRCULATION IN ANIMALS AND PLANTS. PRITCHARD (A.), 1842.

CIVIL SERVICES AND REVENUE DEPARTMENT.

Appropriation Accounts, 1880, &c. Reports of Commissioners, 1876, &c. Reports on Accounts relating to the Civil Lists, 1802. PARLIAMENTARY..Papers, p. 470.

—— Cape of Good Hope. CAPE Colony, 1887, &c., p. 220.

Guide to Civil Service. EWALD, 1885.

India. Report of Select Committee and Index, 1890. INDIA, p. 99.

—— Resolution of Government of India regarding the Uncovenanted Service. INDIA, p. 99.

Papers relative to the obstruction of public business and the organization of the Civil Service. SYMONDS (A.), 1853.

CLASSICS.

Classics for the Million. GREY, 1881.
Iliad, translated by Cordery. HOMER, 1871.
Virgil's Æneid, remarks on. HENRY (J.), 1873.

CLIMATE.

Argentine Republic. DAVIS (G. G.), 1889.
Bibliography. RAMSAY (A.), 1884.
Belgium. QUETELET, 1849.
Brazil. Climatology. MORIZE, 1891.
Buenos Aires. Climate. BUENOS Ayres, 1878.
California. Notes on the climate and Meteorology of Death Valley. HARRINGTON (M. W.), 1892.
Caucasian Climate. STATKOWSKI (B.), 1879.
Change of Climate. AIRY (Sir G. B.), 1860, p. 16.
Chicago. CHICAGO, 1893 ; HAZEN, 1893.
Climatology. DOVE, 1857–69.
—— Comparative Climatology of London and the chief English Health Resorts. THORNTON (B.), 1891.
Climate in its relation to Health. POORE, 1885.
Climates of the World. Influence of currents of the ocean on. BENT (S.), 1872.
France. Climates of, and influence on Agriculture and the inhabitants. MARTINS, 1860.
Guernsey. Climate. HOSKINS, 1852.
Hygiene. ASSMANN, 1894.
—— Hygiene of hot countries. CELLE, 1848.
India, Ceylon and Burmah. Guide to the Climates and Weather of. BLANFORD, 1889.
—— Climate and Rainfall in India. FAYRER (Sir J.), 1883. Add. 500.
—— Climate of India. MARTIN (R. M.), 1861.
London. Climate of. HOWARD (L.), 1883.
New South Wales. Climate of. RUSSELL (H. C.), 1877, '92.
North America. Modifying the climate by closing the Straits of Belle Isle. GOODRIDGE, 1886.
Rio de Janeiro. CRULS, 1892.
Torquay. Climate. TORQUAY, 1884.
United States. Climatology of the, and of the temperate latitudes of the North American Continent. BLODGET, 1857.

See also METEOROLOGY, RAINFALL.

CLOCKS AND WATCHES (HOROLOGY).

Académie Royale des Sciences. Eighty-three papers on horological subjects, cut out of the "Histoire de L'Académie" and the "Mémoires." ACADÉMIE Royale, 1763–1740. App. 543.
Article in Rees's Cyclopedia. FAREY (J.), 1819. App. 550.

CLOCKS AND WATCHES (HOROLOGY)—*continued.*

Articles on. ANONYMOUS, 1784, 1809. App. 544.

Catalogue of the Horological Library, bequeathed by B. L. Vulliamy (Catalogue of Library, vol. 3, pp. 541–581).

Essay on Horology. BERTHOUD (F.), 1763. App. 547.

Excellency of Horology. ANONYMOUS, 1689. App. 544.

Garnier's horological works exhibited at the Louvre. GARNIER (P.), 1827, p. 558. Garnier's horological works and instruments of precision. Notice. GARNIER (P.), 1844. App. 558.

Hints on Horology. ARNOLD (W. S.), 18–. App. 546.

Historical treatise; its rise and progress from the earliest times. HENDERSON (E.), 1836. App. 561.

History from its origin. DUBOIS (P.), 1849. App. 555.

Horologer's Almanack for 1852. BORSENDORFF (L.), 1851. App. 549

Horological Treatise. LEPAUTE (J. A.), 1767. App. 565

Horology and a treatise on clocks and watchmaking. REID (T.), 1812, '26. App. 573.

Index Horarius in tres libros. ANONYMOUS, 1662. App. 544.

Macon. Theoretical and practical school of horology and mechanics at. MACON, 1833. App. 567.

Mechanical and practical treatise on horology. THIOUT (A.), 1741. App. 578.

Memoir on Horology. HESSÉN (A.), 1785. App. 562.

Memoirs on Horology. ANONYMOUS, 1750. App. 544.

Modern Horology. GARUFFA, 1894.

New general astronomical and civil treatise of Horology. MOINET (L.), 1848. App. 568.

Practical Horology for apprentices and amateurs. VIGNIAUX (P.), 1788. App. 579.

Sciences and Liberal and mechanical Arts. (Horology.) ANONYMOUS, 1765. App. 545.

Studies on different questions in Horology. ROBERTS (N.), 1852. App. 574.

Theory of Horology tabulated. FETIL (P.), 1800. App. 557.

Time Geography (d'horologéographie). FLOUTRIERES (P. de), 1619. App. 557.

Treatise on Horology for watches and pendulums. DERHAM (W.), 1731. App. 554.

CLOCKS AND WATCHES (GENERAL REFERENCES).

BEVAN (G. P.), Industries, vol. ii.

Artificial rule of time, to learn the natural and artificial division of time and to know all sorts of clocks and watches and their use. SULLY (H.), 1714, '17, '37. App. 577 & 578.

Catalogue of Clocks and Watches, with remarks on the care of watches, etc. SAVORY (T. C.), 1845. App. 576.

CLOCKS AND WATCHES (GENERAL REFERENCES)—*continued.*

Clock and Watch Work. Elements of.
CUMMING (A.), 1766. App. 553.

Clocks, Orreries, and Sundials, how to construct.
FERGUSON (J.), 1778. App. 557.

Construction and management of Chronometers, Watches and Clocks. DENT, 1842.

Equation tables for adjusting watches and clocks to the motion of the sun. ANONYMOUS, 1731. App. 544.

Mechanical part of Clock and Watch work. Introduction to.
HATTON (T.), 1773. App. 561.

Pons' Clock and Watch manufacture.
PONS (H.), 1823. App. 572.

Royal Society. Extracts from General Index to the Transactions, vols. 1–70, containing all that relates to Clocks, Watches, etc.
ROYAL Society. App. 575.

Treatise on Watch and Clock work, wherein the art of calculating numbers for most sorts of movements is explained, and a history of Clock work. DERHAM (W.), 1696, 1700, '14, '34, '59. App. 554.

Balance. Investigations founded on the theory of Motion, for determining the times of vibration of watch balances.
ATWOOD (G.), 1794. App. 546.

—— New Construction of the compensation balance.
DENT, 1842.

—— Vibration of Watch Balances. ATWOOD (1794).

Dialling. FARIA Aragao, 1805.

—— Directions for making Universal Meridian Dial, capable of being set to any Latitude. WOLLASTON (F.), 1793. App. 581.

—— Art of. LEYBOURN, 1675. De Sargues' Universal Way of Dyaling. KING (D.), 1659.

—— Elliptical or Azimuthal Horologeography. FOSTER (S.), 1654.

—— How to make Dials, etc. LEYBOURN (W.), 1700. App. 566.

—— Way to make all kinds of Dials. FALE (T.), 1593. App. 556.

Escapements. Anchor escapement. SEGUIER, 1845. App. 576.

—— Clock Escapements. DENISON (E. B.), 1849. App. 553.

—— Dead Escapement for Clocks. Improved method of constructing and theory of.
VULLIAMY (B. L.), 1822, '23. App. 579.

—— Escapements in repose and recoil Escapement.
JODIN (J.), 1762, '66. App. 563.

—— Escapements most in use in horology. Description of.
GENEVA, 1831. App. 558.

—— Lever Escapement for watches and marine chronometers.
SCHOOF (W. G.), 1874.

CLOCKS AND WATCHES (GENERAL REFERENCES)—*continued.*

Fundamental properties of the Lever.
VINCE (Rev. S.), 1793. App. 597.

Fusee, Going. On a new construction of.
AIRY (Sir G. B.), 1840. App. 543.

Lighting. Lamp designed to light a dial by a reflector of which the curve is calculated in ratio to the diameter of the dial and the distance of the reflector from the dial.
WAGNER, 182–. App. 580.

Longitude. Treatise on watches for, and Description of two astronomical watches. BERTHOUD (F.), 1792. App. 548.

—— Method of determining at sea with the help of marine clocks and watches, etc.
BERTHOUD (F.), 1775, '87, '92. App. 548.

—— Method of finding the longitude at sea by timekeepers.
WALES (W.), 1794 and 1800. App. 580.

—— Pendulum watches for finding Longitude at sea. Instructions concerning use of. HUYGENS (C.), 1720. App. 562.

Movement of a watch on a declivity that measures time after a peculiar manner. WHEELER (M.), 1784. App. 580.

Pivot Holes of Watches. On a new metallic Alloy for.
BENNET (J.), 1830. App. 547.

Regulation. Art of Regulating watches.
BERTHOUD (F.), 1759 and 1811. App. 547.

—— How to regulate Watches.
ROBERTS (H.), 1841, '49. App. 574.

—— Method of regulating watches and clocks.
SULLY (H.), 1728. App. 577.

Repeating Watch. Manner of regulating.
LE ROY (J.), 1741. App. 565.

—— Essay on. CRESPE (F.), 1804. App. 552.

Seconds Watch. Description of a new.
ROBERTS (H.), 1834. App. 574.

Water Clock. Description of Clepsydra or Water Clock.
HAMILTON (Hon. C.), 1746. App. 560.

Wheels. Royal Exchange. Shape of the Wheel teeth in the Clock. DENT (E. J.), 1844. App. 554.

—— Gears of wheels and pinions in horology. Practical considerations on. PREUD'HOMME (L. B.), 1780. App. 572.

CLOCKS AND WATCHES (CLOCKS).

Automatic Clock, called Dardenne perpetual regulator.
TILLIÈRE and Lust, 1882.

Centesimal clock of E. Cusani compared with ordinary clocks.
RADDI, 1893.

Clock for the correct measurement of time on the sea.
SULLY (H.), 1726. App. 577.

CLOCKS AND WATCHES (CLOCKS)—*continued.*

Contrivance to avoid Irregularities in a Clock's motion occasioned by the action of Heat and Cold upon the rod of the pendulum. GRAHAM (Geo.), 1726. App. 559.

Description and use of Table Clock upon a new construction, going by a weight eight days. MARTIN (B.), 1770. App. 567.

Description of a new invention of a clock for the true measurement of time on the sea. SULLY (H.), 1726.

Elementary treatise on clocks. OZANAM (J.), 1750. App. 570.

Exact measurement of time by clocks, etc. General principles of. JURGENSEN (U.), 1805. App. 563.

General treatise on clocks. ALLEXANDRE (Jacques), 1734. App. 544.

Influence two pendulum Clocks were observed to have upon each other. ELLICOTT (J.), 1739. App. 556.

Irregularities in a Clock's motion, occasioned by the action of heat and cold upon the rod of the pendulum.
ELLICOT (J.), 1753. App. 556; GRAHAM (G.), 1726; GRAHAM (G.), 1726. App. 559.

Isochronism of spiral springs to render clocks more exact.
HOURIET du Loche (F.), 1814. App. 562.

Marine clocks. Treatise on. BERTHOUD (F.), 1773. App. 548.

Measure of time by clocks. BERTHOUD (F.), 1802. App. 547.

Methodical treatise. CHARROST, 1795. App. 551.

New Invention of Clock ascendant on a Plain inclin'd.
GENNES (de), 1678. App. 558.

Observations on the Earliest Introduction of Clocks, etc.
BARRINGTON (Hon. D.), 1778. App. 547.

Prevention of irregularities in the motion of a Clock arising from the influence of heat and cold upon the rod of the pendulum.
ELLICOTT, 1753; ELLICOTT, 1753. App. 556.

Vibrations of Pendulums with different suspending springs.
FRODSHAM, 1838.

Williamson's letter asserting his right to the invention of making clocks to keep time with the sun's apparent motion.
WILLIAMSON (Joseph), 1719. App. 581.

CLOCKS AND WATCHES (CLOCKS, ASTRONOMICAL).

Astronomical Clocks. Note on. GRENIER, 1790. App. 559.

—— Strasburg Cathedral. Description of the astronomical clock of. SCHWILGUÉ (C.), 1844. App. 576.

Geographical and Astronomical Clocks. Description of several and account of a Marine Regulator.
JENKINS (H.), 1760, '78. App. 663.

CLOCKS AND WATCHES (CLOCKS, ELECTRIC). Short history.
BAIN (A.), 1853.

Electro-Magnetic Clocks. Barwise and Bain's successful application of Electro-magnetism as a moving power for Clocks.
BARWISE (J.) and Bain, 1841. App. 547.

CLOCKS AND WATCHES (CLOCKS, ELECTRIC)—*continued.*

Electro-Magnetic Clocks. Inventor of. FINLAISON, 1843.

—— Vindication of Bain's claim to be the first Inventor of. FINLAISON (J.), 1843. App. 557.

CLOCKS AND WATCHES (CLOCKS, PUBLIC).

Public Clocks, Church clocks, and account of Westminster Clock. DENISON (E. B.), 1850. App. 553.

—— Church and other Public Clocks. Treatise on the management of. ABBOTT (F.), 1835, '39. App. 543.

—— Public Clocks, particularly Church Clocks, with correspondence on the subject of a clock for the New Church at Bermondsey. VULLIAMY (B. L.), 1831 and 1884. App. 579.

—— Essay on Public Clocks. JANVIER (A.), 1811. App. 563.

Turret Clocks, Railway Station Clocks, Church Clocks, etc. Construction, regulation, etc., of. VULLIAMY (B. L.), 1823–51.

—— Turret-Clock Remontoirs. DENISON (E. B.), 1849. App. 553.

—— Vulliamy new mode of construction of a turret clock. Advantages attending. VULLIAMY (B. L.), 1831. App. 579.

Glasgow. Description of the new clock of the Cross Steeple of. MITCHELL (A.), 1843. App. 568. Report on the Clocks under the charge of the Corporation made to Glasgow Special Committee on Public Clocks. GLASGOW, 1838. App. 559.

London. King's Garden. 1669. Explication of the Dial set in, and other dials. HALL (F.), 1673. App. 560.

—— Westminster Palace. Paper relating to the great clock for. WESTMINSTER Palace, 1848. App. 580. Original drawings. WESTMINSTER Palace, 1850. 1847–52.

London and Black River in Jamaica. Account of Observations made in, concerning the going of a clock; in order to determine the difference between the lengths of isochronal pendulums in those places. BRADLEY (J.), 1734. App. 550.

Portsmouth to Port Royal, Jamaica. Calculation shewing result of an experiment made with Harrison's Timekeeper in a voyage to determine the difference of Longitude between the two places. HARRISON (John), 1762. App. 560.

CLOCKS AND WATCHES (WATCHES).

American watchmaker and Jeweller. STELLE (J. P.), 1868.

Article from Rees's Cyclopædia. ANONYMOUS, 1823. App. 545.

Cantor Lectures on Watchmaking. RIGG (E.), 1881.

Deck Watches. Rates of. 1888–89, &c. GREENWICH Observatory.

CLOCKS AND WATCHES (WATCHES)—*continued.*

History and principles of watchwork.
JONES (J.), 1845. App. 563.

Pocket Watches, pointing out the defects in their construction.
PARR (W.), 1804. App. 571.

Watchmaker's Handbook. SAUNIER (C.), 1888.

CLOCKS AND WATCHES (CHRONOMETERS).

Change of Rates in Chronometers, as stated to arise from their transfer from one place to another on land, and by their removal from land to shipboard.
PARKINSON (W.), and Frodsham, 1833. App. 571.

Chronometer, Brief account of, with remarks on those furnished to Captains Ross', Sabine's, etc., Expeditions.
PARKINSON (W.), and Frodsham, 1832. App. 571.

Chronometers. BARRAUD, 1850.

Chronometers (Arctic Regions). PARKINSON and Frodsham, 1834.

Chronometers and their management.
SHADWELL (Capt. C. F. A.), 1861.

Chronometric manual. JANVIER (A.), 1821. App. 563.

Chronometric new year's gift for 1811.
JANVIER (A.), 1810. App. 563.

Comparative Rates of Chronometers. Method of ascertaining.
EPPS (J.), 1832. App. 556.

Construction and management of Chronometers, Watches, and Clocks. DENT (E. J.), 1841. App. 554.

Effects of Density of Air on the rates of Chronometers.
HARVEY (G.), 1824. App. 561.

Effects produced in the rates of Chronometers by the proximity of masses of iron. BARLOW (P.), 1821. App. 547.

Eleven years of a chronometer: Kessels, 1254. (Relative to the rate of a marine Chronometer).
ZAHRTMANN (C. C.), 1837. App. 581.

Errors in the Sea Rates of Chronometers arising from the Magnetism of their balances.
SCORESBY (W.), jun., 1882. App. 576.

Errors of Chronometers. DENT, 1842; Dent, 1842. App. 554.

Kessels Chronometer. HANSEN, 1836. App 560.

Laws of Isochronism of the Balance Spring. FRODSHAM, 1849.

Magnetic Intensity of a Chronometer. Remarkable case of.
HARVEY (G.), 1823. App. 561.

Marine Chronometers. Observations on the Comparative Rates of.
BOND (W. C.), 1829. App. 549.

Mercurial Chronometer improved.
CLARKE (J.), 1715. App. 552.

Methods for ascertaining at sea the exact gain and loss of Chronometers, etc. DUHAMEL (Duc), 1832. App. 555.

CLOCKS AND WATCHES (CHRONOMETERS)—*continued.*

Observations on Chronometers from Ross' Narrative of his second Expedition to Arctic regions, 1829 to 1833.
ROSS (Capt. Sir J.), 1835. App. 574.

Rates of Chronometers, 1867–79, '80, &c. GREENWICH Observatory.

—— Plan for ascertaining Rates of Chronometers by an instantaneous signal. WAUCHOPE (R.), 1830. App. 580.

Remarks on the present method of using Chronometers at Sea.
ANONYMOUS, 1818. App. 545.

Toothed barrel and fusee. ROBERT, 1839. App. 574.

Use of the Chronometer, with suggestion for applying it to correct the Latitude as well as the Longitude.
OWEN (E. W. C. R.), 1812. App. 570.

CLOCKS AND WATCHES (TIME KEEPERS).

Time keepers. Time and Time keepers. POISSON, 1846; THOMSON (A.), 1842. App. 578.

—— Descriptive use of Universal Time-piece.
ANONYMOUS, 1834. App. 544.

—— Importance of Time-keepers in Navigation.
HALL (Basil), 1820.

—— Improvements in Time-keepers. LOSEBY, 1852.

—— Mechanism to afford a true mensuration of time. Descr. of.
HARRISON (John), 1795. App. 560.

—— Patent Marine Time-keeper. CROUCHER, 1820.

—— Use of Timekeepers. ANONYMOUS, 1800, p. 50.

CLOCKS AND WATCHES (TRADE).

Apprenticing boys to the Watch Trade. Address showing the evils. ANONYMOUS, 1817. App. 544.

Art and trade of Clock and Watch-making, showing the necessity for further regulations to protect and relieve from distress the persons engaged in the said art.
ANONYMOUS, 1812. App. 545.

Coventry Watchmakers. Report from the Committee on the petitions of. COVENTRY, 1817. App. 552.

Depressed State of the Watch Trade.
POWELL (J.), 1817. App. 572.

Importation of foreign Clocks and Watches from 1787 to 1841. CLOCKMAKERS' Company; CLOCKMAKERS' Company, 1832, 1841. App. 552.

Jackson's trial for feloniously removing the Goldsmiths' Company's marks from one watch case to another
JACKSON (W.), 1816. App. 563.

La Tribune Chronométrique, for use of members of the Corporation of Horologers. DUBOIS (P.), 1852. App. 555; PERIODICAL PUBLICATIONS. App. 571.

Law relating to Watchmakers. Report on.
PARLIAMENTARY. . Papers, 1818. App. 571

CLOCKS AND WATCHES (PARTICULAR REFERENCES).

Airy's Clock Escapement. Description.
AIRY (Sir G. B.), 1842. App. 543.

Arnold's Chronometers. Certificates and circumstances relative to the going of. ARNOLD (John), 1791. App. 545.

—— Pocket chronometer with compensation balance.
ARNOLD (John), 1780. App. 545.

—— Circumstances relative to the going of Mr. Arnold's chronometers. ARNOLD (1791).

—— Chronometers or Timekeepers. Instructions concerning.
DALRYMPLE (A.), 1788. App. 553.

—— Clock at Mannheim, and Pocket Chronometer at Greenwich. ARNOLD (John), 1781. Add. 545.

—— New Pendulum Clock, set up in the Mannheim Observatory. Letter on the going of. MAYER (C.), 1781. App. 568.

—— Time-Keepers, explanation of.
ARNOLD (John Roger), 1805. App. 546.

—— and Dent's Chronometers. Experiment made at Greenwich and Paris Observatories to test accuracy.
ARNOLD (John Roger) and Dent, 1838. App. 546.

Barraud's Chronometers, Drawings and description of compensation balance and testimonials of accuracy.
BARRAUD (H.), 1819, '48. App. 547.

Berthoud's marine clocks. Voyage in 1768 and 1769 to prove.
FLEURIEU (C. P. C. de), 1773. App. 557.

Breguet's Chronometers. GAY-LUSSAC (L. J.), and Arago, 1819. App. 558.

Caron's (junior) new escapement for watches, the Académie des Sciences upon. Report of. ACADÉMIE Royale, 1754. App. 543.

Earnshaw's Chronometers. Protest against granting a reward for. BANKS (Sir J.), 1804. App. 547.

Earnshaw's claim to Commissioners of Longitude's reward for invention of improvements in time-keepers. Appeal and Statement regarding.
EARNSHAW (T.), 1806, 1808. App. 555.

Earnshaw's improvements on time-keepers. Arguments for giving a reward for. MASKELYNE, Rev. N. App. 568.

Earnshaw's Time-keeper. A full answer to the advertisement concerning, in the "Morning Chronicle," Feb. 4, and "Times," Feb. 13, 1806. DALRYMPLE (A.), 1806. App. 553.

Earnshaw and Arnold's Time-keepers. Explanation of.
EARNSHAW (T.), 1805 and 6. App. 555.

Eiffe's and Molyneux's Improvements in Chronometers.
EIFFE (J. S.), 1841. App. 556.

Ellicott's Clock at St. Helena. Observations for proving the going of. (Effect of gravity on going). MASON (C.), 1762. App. 568. SHORT (J.), 1762. App. 576.

CLOCKS AND WATCHES (PARTICULAR REFERENCES)—*contd.*

Emery's pocket Chronometer. Three registers of.
BRÜHL (J. M. de), 1785. App. 550.

Habrecht's Roman Clock, 1589. Description.
HABRECHT (I.), 1825. App. 559.

Harrison's Time-keeper (Principles of). MASKELYNE, 1767; MASKELYNE, 1767. App. 568.

Harrison's Watch at the Royal Observatory. Account of the going of, from May 1766 to March 1769.
MASKEYLYNE (Rev. N.). App. 568.

Harrison's Watch. MASKELYNE, 1767.

—— Minutes of proceeding about reward for.
HARRISON (John), 1765. App. 560.

Laresche's Alarum. Report on.
FRANCŒUR (L. B.), 1822, p. 558.

Le Roy's longitude watches. Description of.
CASSINI (J. D.), 1770. App. 551.

Le Roy's marine watches. Voyage in 1768 to test.
CASSINI (J. D.), 1770. App. 551.

Mudge's improvement in Time-keepers for discovering Longitude at Sea. Considerations in favour of a reward, and objections against, for, and extract relative to his petition for a reward.
MUDGE (Thomas), 1786, '93. App. 569.

Mudge's Timekeepers. Answer to a pamphlet by Mudge junior, relating to. MASKELYNE (Rev. N.), 1792. App. 568.

—— Description and Thoughts on the means of improving watches. MUDGE (Thomas) Jun., 1799. App. 569.

—— Letter relating to. HELLINS (Rev. J,), 1792. App. 561.

—— For discovery of Longitude at Sea. Narrative of facts, relating to. MUDGE (Thomas) Jun., 1792. App. 570.

—— Observation on application to Parliament for a reward for.
BANKS (Sir J.), 1793. App. 546.

—— Register, 1894. Account of first time-keeper in a voyage to and from Newfoundland, 1785.
BRÜHL (J. M. de). App. 550.

—— First Time-keeper. Register of its going from April 1780 to May 1781. MUDGE (Thomas). App. 569.

—— Time-keepers. Reply to Maskelyne's Answer to a narrative of facts relating to.
MUDGE (Thomas) Jun., 1792. App. 570.

—— Petition. Report on, from House of Commons Select Committee on, and enquiry into the principles on which his time-keepers have been constructed.
MUDGE (Thomas), 1793. App. 569.

Roberts' Marine Watches or Chronometers. Report.
SEGUIER (Baron A. P.), 1846. App. 576.

CLOCKS AND WATCHES (PARTICULAR REFERENCES)—*contd.*

Shelton's Clocks. Observations on one of. (Relative to force of Gravity in different places).
MASKELYNE (Rev. N.), 1762. App. 568.

Ulrich's Chronometers. Report on certain improvements in, and memoir of the rise and progress of Horology.
ULRICH (J. G.), 1846. App. 578.

Vulliamy's Clock escapement. DUMÉRY, 1853. App. 555.

Wagner's Cast Iron clock. Description of, and use for churches.
WAGNER, 1822. App. 580.

Woodley's patent time-piece. WOODLEY (W.), 1833.

CLOTHING, Hygiene of. KRATSCHMER, 1894.

COACHBUILDING, Art applied to. JULIAN (H.), 1884.

COACHES (STAGE). *See* CARRIAGES; STAGE COACHES.

COAL. BADDOW and Bannan, 1866; BAUERMAN, 1877; BEVAN (G. P.). Industries, vol. 2; CHEMIN and Verdier, 1888; GESNER, 1865; THOMAS (J. W.), 1878.

Coal Question. BROWN (T. F.), 1891; LEVASSEUR, 1876; PRICE-WILLIAMS, 1889.

Coal physically and socially considered. VIVIAN (H. H.), 1856.

Coal and Coal Oil. BOWEN, 1865.

Crystals of quartz and of calcite in Coal Measures. FIRKET, 1882.

Gas Explosions in Coal Bunkers. ROWAN (T.).

Geological inquiry as to the origin of Coal. HAWKSHAW, 1843.

Geology of Coal seams. MIEBZSCH, 1875.

Heating power of. BUNTE, 1892.

History and uses. THORPE (T. E.), 1878.

History of Coal, Coke, and Coalfields. FORDYCE, 1860.

Production and Consumption. BOUHY, 1875.

Select Committee on the present dearness and scarcity of Coal, 1873. PARLIAMENTARY..Papers, p. 471.

Slack, conveyance of. LÜRMANN, [1884].

Small Coal. Treatment of Small Coal. HALL (C. E.), 1884?

—— Experiments made on Coal and Patent Fuel, 1877–79.
PARLIAMENTARY..Papers, p. 471.

—— Coal Cinders and Patent Fuel shipped coastways and exported, 1887, etc. PARLIAMENTARY..Papers, p. 471.

Statistics of Coal. The geographical and geological distribution of fossil fuel. TAYLOR (R. C.), 1848.

Supply. ARMSTRONG, 1873.

—— Plan for the Employment of Natural Forces, as a substitute for Coal. ANONYMOUS, 1871, p. 52.

—— Coal in all lands. PECHAR (J.) (1878).

Valuation. BUNTE.

COAL—*continued.*

Australian. Report of Experiment, 1863.
PARLIAMENTARY..Papers, p. 470.

Austria. Fossil Coal. HAUER, 1865.

Brownlee. Appeal against an interdict prohibiting the appellant from working the coal within certain lands of Brownlee (Tapon hill). JAMIESON (G. A.) and Russell, 1876. Add. 512.

Canada. Production and manufacture. BARTLETT (J. H.), 1885.

Carlisle. Best means of supplying the city of, with Coals.
LOWRY, 1807.

Cullen Bullen Coal and Coke Company. Directors' Reports.
CULLEN, 1889–90.

France and England. FRANCE, 1872–75, p. 436.

Indian. DANVERS, 1867. Handbook of Commercial Products.
Imperial Institute, 1893. INDIA, p. 99.

London. Possible existence of coal around.
FIRKET, 1882; HOLDSWORTH (J.), 1866.

Maryland Coal and Iron Company. Extracts from report.
SILLIMAN (B. and Sons), 1839.

Nova Scotia. International Coal and Railway Company. Statement, 1867. INTERNATIONAL Coal and Railway Company.

Over Norton, Oxfordshire. Report on the prospect of finding Coal under the estate of. LUCAS (J.), 1891.

Queensland. Supply to the Southern and Western Railway.
QUEENSLAND, 1876, p. 70.

—— Between Dalby and Roma. QUEENSLAND, 1879, p. 70.

United Kingdom. Report of Commissioners, 1871.
PARLIAMENTARY..Papers, p. 470.

—— Our Coal and Coalpits. ANONYMOUS, 1853. Add. 481.

—— Our Coal Resources. HULL (E.), 1890.

—— Probability of finding Coal in S.E. England.
TAYLOR (W.), 1886.

—— Sites for coal-search in. WHITAKER (W.), 1890.

United States. Coal and iron ores of the "great vein" region.
RILEY (J. B), 1873.

—— American Coals applicable to Steam Navigation, etc.
JOHNSON (W. R.), 1844.

Wigan Coal Trials, 1867–68. FLETCHER (L. E.).

COAL (COKING AND DISTILLATION). DAVIES (G. E.), 1884.

COAL (COMPOSITION, COMBUSTION, AND EVAPORATIVE POWER).

Apparatus employed in the analysis of Coal and Coal Gas.
BANISTER, 1867.

.. Coal Combustion. Researches. SCHEURER-KESTNER (A.), and Meunier-Dollfus, 1875.

COAL (COMPOSITION, COMBUSTION, AND EVAPORATIVE POWER)—*contd.*

Remarks on Williams' Treatise on Combustion of Coal. URE (A.), 1840.

Testimonials to Mr. Williams' mode of effecting Combustion of Coal in furnaces. BRETT (R. H.), etc., 1841.

Evaporative power of different kinds of Coal. FYFE, 1841.

Heating properties of Coke and Coal compared. PELLATT (A.), [1857].

Properties and chemical constitution of Coal. HOOD, 1841.

Qualities of the different kinds of. URE (A.), 1839.

COAL (SHIPS).

Coal for the Navy. Reports, 1848–51. Reports on Experiments, 1860–73. Trials of Coal made by the Admiralty, 1859, 1876. Supplies of Coal for the use of H.M. Navy, 1889. PARLIAMENTARY..Papers, p. 470–1.

—— Experimental trials of Coal on board the "Urgent" and "Lucifer," 1870. PARLIAMENTARY..Papers, p. 470.

Spontaneous Combustion in Ships. Report of Royal Commission, 1876. PARLIAMENTARY..Papers, p. 471.

—— List of cases, 1878, 1878–86. PARLIAMENTARY..Papers, p. 471.

—— Letter of Board of Trade to Coal Owners, Shippers, etc., with regard to character and number of casualties, 1879. PARLIAMENTARY..Papers, p. 471.

—— Coal Cargoes: Spontaneous Combustion and Explosions in them. ROWAN (T.), 1882.

COALS (SHIPMENT, HOISTS, AND DROPS).

Bellecourt. Rolling Crane for the lading of boats. MARIEMONT, 1891. Add. 518.

Middlesbro'-on-Tees. Drops used for the shipment of Coals. TURNBULL (G.), 1846.

Systems and Appliances for Coal-tipping and Warehousing at the various ports in Wales, 1881. GREENOCK.

COAL (WASHING AND TREATING OF).

Coal Washing. DANVERS, 1869; MARSAUT, 1878. In the mines of Bessèges. MARSAUT, 1880. Lührig's Method. RATHBONE (E. P.), 1880.

Purification of. BÉRARD (A.), 1856.

COAL (ANTHRACITE).

Briquettes Manufacture. GURLT, 1880.

—— of Anthracite and Lignite. PREISSIG, 1887.

Chemistry. MUCK, 1891.

COAL (ANTHRACITE)—*continued.*

Formation of Ammonia by dry distillation.
MÜLLER (F. C. G.), 1888.

Germany and other European Countries.
GEINITZ, Fleck and Hartig, 1865.

Iron. Use of Anthracite in the Manufacture of.
JOHNSON (W. R.), 1841.

Locomotives on the Reading Railroad. Report on the use of Anthracite Coal in. WHISTLER (G. W.), Jun., 1849.

Osfrau-Karwin. JICINSKY, 1885.

Pennsylvania. Working of Anthracite in. SAUVAGE (E.), 1893.

—— Visit to the Anthracite Districts of.
CADELL (H. M.), 1891. Add. 490.

—— Anthracite Coal Mines. PENNSYLVANIA, 1871–79.

Player's patent method of burning anthracite.
SCHAFHÄUTL (C.) and Bevan, 1840.

Prospectus and reports. ANTHRACITE Patent Company, 1840.

Wales (South) Anthracite Association. LEIGHTON, 1841.

Western Middle Anthracite Field. Review of the Atlas of, 1884.
LYMAN.

COAL (CRETACEOUS). Coals of the North-west, U.S.A.
PUMPELLY, 1880.

COAL (STEAM).

Use of Steam Coals in Marine Boilers. ARMSTRONG (Lord), Longridge, and Richardson, (1858).

Aberdare and of Hartley, comparative value for marine purposes. Experiments on the "Isabella Croll," screw steamer, at Cardiff. DOBSON (S.), 1859.

Lancashire (South) and Cheshire. Trials at Wigan, 1867.
PARLIAMENTARY..Papers, p. 470.

North of England and Welsh. Reports on tests at Devonport.
PARLIAMENTARY..Papers, p. 471.

COAL FIELDS (COAL MEASURES).

Alabama, 1875. LOUISVILLE and Nashville Railroad.

Appalachian region of the United States. LESLEY, 1856.

Blossburg Coal Regions. Mineralogical Report.
TAYLOR (R. C.), 1833.

Burnley. GEOLOGICAL Survey, 1875; HULL (E.), etc., 1875.

Cape Colony. Coal Deposits in the Indwe Basin and Stormberg Range of Mountains. CAPE Colony, 1889, p. 221.

China. Coals from Se-shan. KNIGHT (Sparrow), 1867.

Connaught. Geological and Mining Survey.
GRIFFITH (R.), Jun., 1818.

England. Coalfields and overlying foundations. MURCHISON, 1839.

—— Midland Counties. Extension beneath the secondary formations. HOLDSWORTH (J.), 1866.

COAL FIELDS (COAL MEASURES)—*continued.*

England. Midland Coalfield. Mode of working, and the mechanical appliances. FOWLER (G.), 1870.
—— Comparative facilities of the Midland, Northumberland, and Durham Coal Fields for the supply of London. HOLMES (W. D.), 1837.
—— Correlation of the Coal seams of the carboniferous formation of the North of England. BROWN (M. W.), 1887.
—— Coal in the South-east. WHITAKER (W.), 1890.
—— The coalfields of Gloucestershire and Somersetshire, and their resources. ANSTIE, J., 1873.
Great Britain. HULL (E.), 1861, '73, '81.
India. Coalbeds of the Nerbudda Valley, 1855, '56. INDIA, p. 127.
—— Coal resources and production of. INDIA, 1868, p. 99.
—— Nizam's dominions. HEENAN, 1875.
Japan. Yesso. MONROE, 1874.
Lanarkshire, Upper Coalfield of. Proposed railway to connect it with Glasgow. GRAINGER and Miller, 1828.
Lancaster, Vicinity of. PHILLIPS (J.), 1837.
Leicestershire, Geology of. GEOLOGICAL Survey, 1860; HULL (E.), 1860.
Leinster. Geological and Mining Report. GRIFFITH (R.), Jun., 1814; MEADOWS, 1874.
Loire, France. GRUNER, 1847.
Madras Presidency, 1855. INDIA, p. 123.
Missouri. Report, 1872. MISSOURI.
Natal. Report. NATAL, 1881.
Newcastle Coalfields. Models illustrating the nature of stratification, valleys of denudation and succession of coal seams. SOPWITH (T.), 1841, p. 225.
Newcastle district. Synopsis of the several seams of Coal. BUDDLE, 1831.
New Zealand. Mount Rochfort Coalfields. WRIGG (H.), 1868; NEW ZEALAND, 1868, p. 409.
—— Buller Coal Field, 1875. NEW ZEALAND, p. 409.
Northumberland and Durham Coalfields. Sections of the Coal seams. SIMPSON (J. B.), 1877.
Nova Scotia. GILPIN (E.), 1886.
—— Coal from Springhill, co. Cumberland. HARTLEY (E.), 1870.
—— Coals and Iron Ores of Picton county. HARTLEY (E.), 1870.
Ohio (Southern). HUNT (T. S.), 1881.
Pennsylvania. BOWEN, 1848.
—— Stratigraphy of the Bituminous Coal Field of Pennsylvania, Ohio and West Virginia. WHITE (J. C.), 1891.
—— Visit to the coal Districts of. CADELL (H. M.), 1891. Add. 490.

COAL FIELDS (COAL MEASURES)—*continued.*

Peru. Coal and Mineral Resources of Peru.
LANE (E.), 1892.

Punjab, 1859, '83. INDIA, p. 129.

Queensland. Bowen River Coalfield. Report.
BOWEN River, 1879.

—— Coal Resources. TENISON-WOODS, Rev. (J. E.), 1883.

Rajore and Sasti. Report, 1872. JOHNSTON (T. M. H.).

Risca Colliery coalbeds. Report on them by Messrs. Dickinson, Wales and Cadman. RISCA Colliery, 1881.

Sigrowli and Kurhurbari Coal Fields. SMITH (D.), 1857.

Somerset, East, and Bristol.
GEOLOGICAL Survey, 1876; WOODWARD (H. B.), 1876.

Spain. Catalonia and Asturias. KENSINGTON, 1892.

Staffordshire (South). GEOLOGICAL Survey, 1859; JUKES, 1859.
Thick coal. HUGHES (H. W.), 1885.

Tasmania. Fingal and Mount Nicholas Coal Deposits. Report.
FINGAL, 1883.

Texas. Report on Brown Coal and Lignite of.
DUMBLE (E. T.), 1892. Add. 497.

United States. Coal Reports, etc. UNITED STATES, p. 342.

Victoria Coal Fields. Reports on.
VICTORIA, 1868, '72, '73, p. 375.

Virginia and Kentucky. Geology of the Big Stone Gap coal field of. CAMPBELL (M. R.), 1893. Add. 490.

Virginia (West). Some coal measure sections near Peytona.
LYMAN (D. S.), 1894. Add. 517.

Warwickshire. GEOLOGICAL Survey, 1859; HOWELL (H. H.), 1859.

Yorkshire. GEOLOGICAL Survey, 1878.

Zwickauer Basin. Stratification of Coal Seams. KLÖTZER, 1852.

COAL MINES (GENERAL REFERENCES).

Coal Pits and pitmen. BOYD (R. N.), 1892.

Collieries. BEVAN (G. P.). Industries, Vol. 2.

Colliery Mineral Waters, concretion balls derived from.
ANDREWS (T.), 1875, 1879.

Organisation of labour. LEDOUX, 1890.

Probable exhaustion of our Coal Mines. JEVONS, 1866.

Projected measures for the defence of. DODD, 1798.

Reports of Inspectors of Coal Mines, 1851–60.
PARLIAMENTARY..Papers, p. 472.

Report of Select Committee on Coal Mines, 1852.
PARLIAMENTARY. Papers, p. 472.

Use of Iron in lining shafts, etc., of mines of the Société Cockerill at Seraing. ANONYMOUS, 1880, p. 50.

COAL MINES (GENERAL REFERENCES)—*continued.*

Bascoup. Mechanical Sorting. GODEAUX, 1885. Add. 503.

—— Stauss system of lowering. DEMEURE, 1887. Add. 496.

Bessèges, Compagnie Houillière de. BESSÈGES, 1882.

Belgium. Development of the Industry.
HARZÉ, 1882; BURAT, 1861.

Canadian Frontier. Documents relating to the Coal Hills, Victoria and Bedford Mines on the.
CANADA, 1855. Add. 490.

Chili. British Capital. GANA, 1889.

Chili and Panama Coal Mines. Report.
WHEELWRIGHT (W.), 1843.

Colorado. Report of State Inspector. COLORADO, 1887.

Dean Forest Mining Commissioners' Award as to Coal mines, and the rules and regulations for working them.
SOPWITH (T.), 1841, p. 224.

Dean Forest Collieries. Address to Miners.
SOPWITH (T.), 1838, p. 225.

Dombrowa Collieries. PARIS, p. 457.

Dortmund Amalgamation. MULVANY (W. T. and T. R.), 1882.

Durham and Northumberland. HOLMES (J. H. H.), 1816.

Fort Payne Coal and Iron Company. FORT PAYNE, 1888.

France, 1859–75. BURAT.

Great Britain. ANONYMOUS, 1841, p. 46.

Heraclea (near). Nature and quantity of coal, 1854.
PARLIAMENTARY..Papers, p. 470.

Hungary. Coal seams and Coal mining.
HANTKEN, 1878. Add. 505.

India. BALL (V.), 1881. Legislation and inspection. DOYLE, 1886.

—— Lakadong in the Jynteah Hills, 1853. INDIA, p. 122.

—— Coal Mines at Thatay Khyoung, 1863. INDIA, p. 132.

Loire, basin of the. Coal Mines and Workshops. LAUR, 1879.

Mariemont and Bascoup Coal Mines Societies. Notice.
PARIS, 1889. Add. 525.

Mons, en Hainaut. BOUHY, 1855.

Mount Carbon Coal Mines, Illinois. ASTON, 1841.

Murchison Range. Guide. SAWYER (A. R.), 1892.

New South Wales Collieries, Coalfields.
SWINNEY (A. J. G.), 1884.

—— Mittagong. Fitzroy Coal Mines. Report on their present condition. THOMAS (J. H.), 1859.

New Zealand. Development, 1872. NEW ZEALAND.

COAL MINES (GENERAL REFERENCES)—*continued.*

Northumberland and Durham. Sketches. HAIR, 1839.

Queensland. Burrum Coal Mines. BURRUM, 1878.

Seaham Colliery. Report of Experiments made by F. Abel with samples of its dust. SEAHAM Colliery, 1880.

Spain. The Asturias. FORSTER, Cooper and Jamieson, 1843.

South Boghead Coal Mines. Reports on their Produce. SOUTH Boghead Coal Mines, 1857.

United States. ASHBURNER, 1887; BELL (Sir I. L.), 1875, p. 119. Western coast. GOODYEAR, 1877.

Wales (North). Cae-Pen-Ty Colliery. BUTLER (W. F.), 1880.

Wednesbury (Great Western Railway), 1875. GREAT Western Ry. Wednesbury Coal Mines and the G. W. Rly. Reports and Correspondence relating to. WEDNESBURY Coal Mines, 1875.

COAL MINES (ACCIDENTS).

Colliery Accident Funds in Great Britain. Return, 1893. PARLIAMENTARY..Papers, p. 472.

Fire damp and accidents caused by it. LE CHATELIER (H.), 1890.

—— Limits of inflammability. LE CHATELIER (H.), 1891.

Report of Select Committee on best means of preventing the occurrence of dangerous accidents in Coal Mines, 1849. PARLIAMENTARY..Papers, p. 471.

Society for preventing Accidents in Coal Mines. BUDDLE, 1814.

Baddesley Colliery. Reports on the accident of May 1, 1882. BADDESLEY Colliery.

Brynmally Colliery at Moss. Accident at the Pendwll Pit, 1889. BRYNMALLY Colliery, 1889.

Clay Cross Collieries. Accident, 1882. CLAY Cross.

Clifton Hall Colliery. Explosion in the Trencherborne Mine, 1885. CLIFTON Hall.

Gethin Colliery. Report on accident, 1863. GETHIN.

Hartley New Pit. Catastrophe, 1862. REID (T. W.).

Lanarkshire. Home Farm Colliery Inundation. Report, 1877. HOME Farm.

Morningside Colliery. Fatal accident to Thomas Brown. MORNINGSIDE, 1888.

Ravenslodge, Dewsbury. Accident, Aug. 4th, 1892. RAVENSLODGE.

South Shields Committee. Report on Accidents in Coal Mines. SOUTH Shields, 1843.

Staffordshire, North. Coalfield. Accidents due to falls of roof and sides. SAWYER (A. R.), 1886.

COAL MINES (Boring).

Clifton Colliery, Sinking of. Brown (J. M.), 1881.

Dover. Co-relation of the Franco-Belgian, Dover, and Somerset Coalfields. Brady (F.), 1892.

Eastern Counties Coal Boring and Development Syndicate. Geological Reports. Eastern Counties, 1893.

Glasgow. Boring for Coal in the Green of. Cleland, 1822.

Llanbradach. Sinking Appliances at. Galloway (W.), 1888.

COAL MINES (Employment of Children).

Employment of children in, United Kingdom. Anonymous, 1842, p. 42; Dupin, 1840.

—— Report, 1842. Parliamentary..Papers, p. 471.

COAL MINES (Explosions). Atkinson (W. N. and J. B.), 1886; Griffith (J.), 1867; Higson, 1878. Causes, prevention, or control. Blackwell (J. K.), 1853.

Connection with the weather. Scott (R. H.), and Galloway, 1872, '74. And the weather of 1885. Anonymous, 1886, p. 42.

Explosions in Coal Mines. Atkinson (W. N. and J. B.), 1886.

Prevention of Colliery explosions. Colwell, 1861, 1892.

Report on the Gases and Explosions in Collieries, 1847. Parliamentary..Papers, p. 471.

Solution of Colliery Explosions. Morgans, 1887.

Coal dust. Galloway (W.), 1887. Report of Royal Commission, 1891–94. Report by H. Hall, 1893. Parliamentary..Papers, p. 472.

Firedamp and atmospheric perturbations. Cornet, 1881.

—— Explosions of firedamp. Gendebien, 1885.

—— Connected with Atmospheric depressions. Harzé, 1881.

—— Fluctuations of Atmospheric Pressure on the evolution of fire-damp. Archduke Albert's Coal Mines, near Karwin, in Austrian Silesia. Karwin, 1886.

—— History. Graves (H. G.), 1893.

—— Note on the proportioning of fire-damp for the limits of inflammability. Lebreton (F.), 1894. Add. 515.

—— Proposal for destroying the fire- and choak-damp of. Trotter (Dr. T.), 1805.

—— Regulations in Belgium, England and Germany. Pernolet and Aguillon, 1881.

—— Use of explosives in the presence of Firedamp in mines. North of England Institute, 1890.

—— Dubois and François Machines. Clerc, 1883.

—— Firedamp Detector. Garforth, 1884.

Abercarne Colliery. Government Report on Inquest. Abercarne Colliery, 1879.

COAL MINES (EXPLOSIONS)—*continued.*

Abram Colliery. ABRAM, 1882.
Altofts Colliery. ALTOFTS, 1887.
Apedale Explosion, 1885. APEDALE Colliery.
Barnsley Collieries. Sudden outbursts of gas. BARNSLEY Collieries, 1879.
Belgium. Explosions of fire damp. BELGIUM, 1880, p. 116.
Blantyre Colliery. Explosion of Fire-damp. BLANTYRE Colliery, 1877, 1878, 1879.
—— Second Explosion. BLANTYRE Colliery, 1879.
Bunker's Hill. Explosion. BUNKER'S Hill Colliery, 1875.
Camerton Colliery, explosion in the new pit, 1893. CAMERTON Colliery.
—— Examination showing that Coal-Dust is an Explosive Agent. STUART (D. M. D.), 1894.
Crumbouke Mine, 1886. Explosion of Firedamp in. BEDFORD Colliery.
Darley Main Colliery, 1849. DARLEY.
Dean Lane Colliery Explosion. DEAN Lane, 1887.
Dinas Colliery Explosion. DINAS, 1879.
Dukinfield Colliery Explosion, 1874. DUKINFIELD.
Elemore Colliery. Explosion, Dec. 2, 1886. ELEMORE.
Great Fenton Colliery, 1885. GREAT Fenton.
Hale End Colliery, Sept. 6, 1884. HALE End, 1885.
Hartley New Pit, 1862. REID (T. W.).
Haswell Collieries. HASWELL, 1844, '45.
Herbertshire Colliery Explosion. Report, 1893. HERBERTSHIRE.
Hyde Colliery, 1889. HYDE Colliery.
Jarrow Colliery Explosion, 1830. BUDDLE.
Llanerch Colliery, Report. LLANERCH, 1890.
Mardy Colliery Explosion, 1886. MARDY Colliery.
Mauricewood Colliery. Report on Explosion, 1890, MAURICEWOOD.
Morfa Colliery, Port Talbot. Explosion, March, 1890. MORFA Colliery.
Mossfields Colliery. Explosion, 1890. MOSSFIELDS Colliery.
Newbottle Colliery, Durham, Explosion, June, 1885. NEWBOTTLE.
Oaks Colliery, Report, 1867. OAKS Colliery.
—— Oaks and Talk o' th' Hill Colliery. Reports, 1867. OAKS Colliery, TALK o' th' Hill.
Penygraig Disaster, cause of the explosion. GALLOWAY (W.), 1881.
—— Colliery Explosion, 1881, '84. PENYCRAIG.
Pochin Colliery, Tredegar. Report, 1885. POCHIN Colliery.
Rhondda Valley Colliery, Reports on disaster at, 1893. GREAT Western Colliery.

COAL MINES (EXPLOSIONS)—*continued.*

Risca Colliery Explosion, 1881. Minutes of Evidence at the inquest and report by R. S. Wright. RISCA Colliery.

Ryhope Colliery. Explosion of an air receiver, 1888. NORTH of England Institute; RYHOPE Colliery, 1883.

St. Helen's Colliery Explosion. Report, 1888. ST. HELEN'S Colliery.

Seaham Colliery. Explosion, Sept. 8, 1880. Report, Minutes of Evidence, etc. SEAHAM Colliery, 1881.

Swaithe Main Colliery Explosion, 1876. Report. SWAITHE Colliery.

Talk o' th' Hill Colliery Explosion, 1867. Report. OAKS Colliery, TALK o' th' Hill Colliery.

Town Hill Colliery. Report on an Explosion at, 1884. TOWN HILL Colliery.

Trimdon Grange Colliery. Explosion, Feb. 16, 1882. Report. TRIMDON Grange Colliery.

Tudhoe Colliery. Report on the Explosion, April 18, '82, in the Brockwell Seam. TUDHOE Colliery.

Udston Colliery. Report by J. Dickinson and Maconochie on Explosions at, 1887. UDSTON Colliery, 1887. Report by R. Moore on the circumstances attending an Explosion at, 1887. UDSTON Colliery, 1888.

Usworth Colliery Explosion, March, 1885. Report on, and Minutes of Evidence at Inquest. USWORTH Colliery.

Victoria Colliery, Bruntcliffe. Report of an explosion at, 1878. VICTORIA Colliery.

Wales (South). Albion Colliery Explosion. Report, 1894. ALBION Colliery. Add. 480.

Wallsend Colliery Explosion, 1835. BUDDLE.

West Stanley Colliery Explosion, April 19, 1882. Report. WEST Stanley Colliery, 1882.

Whitehaven Colliery Explosion on April 25, 1882. Report. WHITEHAVEN Colliery, 1882.

Whitfield Colliery Explosion, Feb. 7, 1881. WHITFIELD Colliery.

Ynyshir National Colliery. Report of Explosion on Feb. 18, 1887. YNYSHIR National Colliery.

COAL MINES (LEGISLATION).

Act for regulating the sale and delivery of Coals, 1831. PARLIAMENTARY..Papers, p. 471.

Bill for the relief of Colliery Tenants, 1888. PARLIAMENTARY..Papers, p. 472.

Coal Mines Regulation Act. Reports of Select Committee, 1853–54. PARLIAMENTARY..Papers, p. 472.

Coal Mines Acts, 1872 and 1886. Bill to consolidate, 1887. PARLIAMENTARY..Papers, p. 472.

COAL MINES (LEGISLATION)—*continued.*

Coal Mines Regulation Act, 1887. Bill to extend the Act to the Iron Ore Mines of Cumberland and Lancashire. CUMBERLAND, 1888.

—— Return of Prosecutions, 1890. PARLIAMENTARY..Papers, p. 472.

—— Bill to amend, 1891. PARLIAMENTARY..Papers, p. 472.

Handbook of the law and leading cases. FOWLER (J. C.), 1872.

Laws regulating the working. ABEL (Sir F. A.), 1889.

COAL MINES (LIGHTING).

How to light a Colliery with Electricity. WALKER (S. F.), 1892.

Safety Lamps. BAGOT (A. C.), 1879; BELGIUM, 1843, p. 116; DAVY (Sir H.), Works, vol. 6; DAVY, 1818; HALL (T. Y.); MARSAUT, 1883. Construction and comparative merits. BAGOT (A. C.), 1879. Magnetic fastening. RAFFARD, 1889.

—— Experiments at Aldwarke Main Colliery, 1884. MIDLAND Institute of..Engineers.

—— Priority of invention. CLANNY, 1844.

—— Davy's lamp demonstrated to be insecure by chemical experiments, and the perfect security of Upton and Roberts' new safety lamp proved. UPTON (G.), and Roberts, 1833.

—— Elvin Safety Lamp. HEMPTINNE, 1847.

—— Marsaut Safety Lamp. DICKINSON (J.), 1883.

—— Miners' Safety Lamps. MARSAUT, 1883, '84.

—— Mueseler's and Dr. Reid Clanny's. MUESELER, 1843.

—— Patent Safety Lamp. YATES (W.), 1870.

COAL MINES (VALUATION OF). HOSKOLD, 1877; LACRETELLE, 1870.

COAL MINES (VENTILATION). BRUNTON (W.), 1849.

Furnace and Steam Jet. Their relative value in the ventilation of Coal Mines. WOOD (N.), 1853.

Plan for ventilating. MARTIN (John), 1849.

South Staffordshire. Ventilation. GIBBONS (B.), 1847.

Treatise on the Gases met with in Coal Mines. ATKINSON (J. J.), 1879.

Ventilating and Working. RAMSAY (J. A.), 1882.

Ventilation. Principles and practice. BAGOT (A. C.), 1879, 1882; STRUVÉ (W. P.), 1852.

COAL MINES (WORKING). DEMANET, 1859. Coal working at a depth of less than 1000 meters. DEVILLEZ, 1859. Working and Ventilation. HEDLEY, 1851.

Belgium, France, Germany and England. Explanation of comparative methods employed. PONSON, 1852–54, 1867.

COAL MINES (WORKING)—*continued.*

Coal Mining Plant, Working Drawings. POVEY-HARPER.
Coal Viewer and Engine Builder's Practical Companion. CURR, 1797.
Colliery Machinery. PERCY (C. M.), 1890.
Colliery Management. HYSLOP, 1876.
Colliery Manager's Handbook. PAMELY, 1891.
Colliery Manager's Pocket Book, 1876. HUTCHINGS.
Inspection. BOYD (R. N.), 1879.
Liége district. MALHERBE, 1863.
Longwall method of Working. GARFORTH, 1885; WAIN, 1892.
Mechanical Engineering of Collieries. PERCY (C. M.), 1885–6.
New South Wales. Progress and report from Select Committee on Working of Collieries, etc., 1894. NEW SOUTH WALES. Add. 522.
Screening, transport, etc. DANVERS, 1872.
Thompson's Inventions, Improvements, etc., in the combined practice of Colliery Engineer and General Manager, with discussion on the Coal Trade Regulations. THOMPSON (Ben), 1847.
Winning and working of Collieries. DUNN (M.), 1852.

COAL MINING.

Coal and Coal Mining. SMYTH (Sir W. W.), 1867, '72; WALTON (T. H.), 1885.
Glossary of Terms. GRESLEY, 1883.
Haulage of Coal. BAINBRIDGE, 1869.
—— Underground haulage of Coal by Wire Ropes. HILDENBRAND, 1884.
Historical account. EDINGTON, 1814.
Mining Coal by Compressed Lime. SMITH (Sebastian), 1882.
Practical treatise. ANDRÉ, G. G., 1875–76.
Shot firing in Mines. GALLOWAY (W.), 1888.
Text Book. HUGHES (H. W.), 1892.
Theory and practice. FOWLER (G.), 1870.
Use of explosives. KROHN, 1893.
Winding and Overwinding. PERCY (C. M.), 1880.
Belgium, since 1865. DUJARDIN-BEAUMETZ, 1888.
France, since 1865. DUJARDIN-BEAUMETZ, 1888.
India, 1869. INDIA, p. 99; Coal mining by blasting in the Bengal Coalfield. DOYLE, 1885.
Pennsylvania Coal-Waste Commission. PENNSYLVANIA, 1893.
United Kingdom. Relative dangers of Coal and Metal Mining in the United Kingdom. FOSTER (C. Le. N.), 1885.
—— Great Britain. History. GALLOWAY (R. L.), 1882.
—— England, since 1865. DUJARDIN-BEAUMETZ, 1889.

COAL TAR.

Account of specimens of Coal Tar products shown at the Exhibition of the Philosophical Society, Glasgow, 1880.
BOULTON S. B., 1882. Add. 486.

Past, Present and Future of Coal Tar.
WILLIAMS (Greville), 1882. Add. 539.

COAL TRADE. ANONYMOUS, 1830, p. 42; ANONYMOUS, 1830, p. 45; BOYD R. N., 1892; EDINGTON, 1814.

Bessèges, Colliery Company. Provision for succour and assistance.
MASSACT, 1889.

Comparative commercial values of Gas-Coal and Cannels.
GRAHAM D. A., 1882.

Cumberland West. FLETCHER L., 1878.

London, Port of. Acts and Amended Act for the sale of Coal in the Port of London, 1807. LONDON, p. 255.

—— *Byelaws for regulating Vessels laden with Coals,* 1838.
LONDON, p. 255.

—— *Observations on the duty of sea-borne Coal,* 1831.
LONDON, p. 255.

—— *Coal Trade (Port of London) Bill.* Reports from the Select Committee, 1833. LONDON, p. 255.

—— Annual average price per ton of the best coals at the ship's side in the Port of London, 1861–89. LONDON, p. 255.

—— *Taxation of Coals.* HARDIE (1793).

New York State. Distribution, classification and cost delivered over different routes. NEW YORK STATE, 1866.

Northumberland and Durham. Glossary of Terms.
GREENWELL (G. C.), 1888.

Ohio River. Transportation of Coal. BOGART, 1892.

Rhine (Lower) and Westphalia. Coal Industry.
NATORP, 1880.

United Kingdom. MEADE (R.), 1879.

— — *Evidence on the state of the Coal Trade.* SYKES (J.), 1829.

—— *England.* GARDINER (R.), 1796.

—— *England and Wales.* Report of Select Committee, 1800.
PARLIAMENTARY..Papers, p. 471.

— — —— *Report of* Select Committee, 1836.
PARLIAMENTARY..Papers, p. 471.

— — *Great Britain and Ireland.* Potts' Mining Register and Directory for the Coal Trades, etc.
PERIODICAL PUBLICATIONS, p. 21.

— — *Great Britain.* ANONYMOUS, 1841, p. 46.

— — Wales (South) Coal trade and its allied industries.
WILKINS (C.), 1888.

— Warwickshire and Staffordshire, Injury to, by the unequal charges on the Grand Junction Canal. DURELL, 1845.

COAL STRIKES. *See* STRIKES.

COASTS AND COAST WORKS. CORNAGLIA, 1888, '91.

Coast erosion. Recent Enquiries into.
BOURDILLON (J. W.), 1886. Add. 486.

Is the sea-shore free to all? ANONYMOUS, 1884. Add. 48.

Rights of the Crown and Privileges of the subject in the Sea-Shores. HALL (R. G.), 1875.

Baltic. Rising and Sinking of the Prussian Coasts.
HAGEN (G.), 1866.

—— Dune works on. KRAUSE, 1850.

Belgium. MEY, 1885.

Dover (Straits of). Erosion of the coasts of, and the possibility of their protection. MARCHAL (L.), 1881. Add. 518.

England, South Coast of. Alluvial formations and local changes.
REDMAN (J. B.), 1854.

England and Scotland. Survey. COLLINS (Capt. G.), 1693.

England and Wales, erosion. BRITISH ASSOCIATION, 1886–88.

France, Coasts of, their secular transformation.
GIRARD (J.), 1881. Add. 503.

—— France, Sea-shores of. Changes.
GIRARD (J.), 1888. Add. 503.

—— Swelling and Depression of the soil on the coasts.
GIRARD (J.), 1876. Add. 503.

—— Vibrations. DELESSE, 1872.

Ireland. Nautical Descriptions. MACKENZIE (M.), 1776.

Lengo and Barcola, Sea breach between. ROSENKART, 1860.

New Jersey Coast, Beach protection. Littoral Movements of the, and jetty reaction. HAUPT (L. M.), 1890.

Norfolk Coast. Encroachments of the German Ocean.
HEWITT (W.), 1844. Add. 507.

Scotland. Orkney and Lewis Island. MACKENZIE (M.), 1791.

—— West Coasts and Western Islands. MACKENZIE (M.), 1775.

Yorkshire. PHILLIPS (J.), 1853.

See also SEA DEFENCES.

COBALT ORE. Flintshire. FOSTER (C. Le N.), 1881.

COCO-NUT TREE. Natural and economical History.
MARSHALL (H.), 1832.

COFFERDAMS. Cofferdam or Caisson without timber or iron in its construction. HARRIS (R. L.), 1891.

Description of a portable one adapted for the use of harbours and marine works in exposed positions. STEVENSON (T.), 1858.

Description of the Coffer Dam used at Davis Island Dam.
MARTIN (W.), 1881.

See also CAISSONS.

COINAGE. *See* MEASURES.

COKE.

Coke from Turf. Statement respecting the method and cost of producing. VIGNOLES (C. B.), 1850.

Heating properties of coke and coal compared. PELLATT (A.) [1857].

Manufacture of, and collection of bye-products by the Simon-Carvés process. BRECKON, 1884.

Preparation of, for the manufacture of cast iron. CRACE-CALVERT.

Use of improved, for obtaining increased strength of Cast Iron. CRACE-CALVERT, 1855.

New South Wales. Report on Manufacture of Coke. NEW SOUTH WALES, 1890, p. 401.

Semet-Solvay Coke Oven, with recovery of bye-products. DEMANET, 1890.

COLD AND REFRIGERATION. OELWEIN, 1891.

Artificial production of Ice and Cold. PAUL (B. H.), 1869.

Different systems of refrigeration. PERROT (S. DE), 1893.

Distribution in America. GUTERMUTH, 1892.

Freezing Process. POETSCH, 1886.

Ice-making machines. LEDOUX, 1879.

Manufacture of Ice by the Bath process. BAGSHAWE, 1886.

Mechanical Refrigeration of Air and its Applications. LIGHTFOOT, 1885.

Mechanical Refrigeration. DE LA VERGNE, 1883.

Preservation of Foods by Cold. LIGHTFOOT, 1881; POSTLE, 1882.

Refrigerating Machines. SCHRÖTER, 1887, '90. Pontifex Machines. COLLINGWOOD, Martin and Abbott, 1887.

Theory of regelation. LE CHATELIER (H.), 1892.

COLLEGES. *See* UNIVERSITIES, Colleges, Schools, etc.

COLLISIONS AT SEA. Regulations for prevention. GRAY (T.), 1867.

COLONIES.

British Enterprise beyond the Sea. BANNISTER (S.), 1849.

Colonial Questions pressing for immediate solution. MACFIE (R. A.), 1870.

Colonies at home providing for the poor population of Ireland by the cultivation of the soil. ALLEN (W.), 1832.

Colonies of the British Empire. History. MARTIN (R. M.), 1843.

Emigration to British Colonies. BATE, 1862.

England and her Colonies. FROUDE, 1886.

Imperial federation of Great Britain and her Colonies. YOUNG (F.), 1876.

Africa (South). Handbook. SILVER (S. W.) and Co., 1875, p. 199.

COLONIES—*continued.*

America (Central). Proposed Colony in the district of Black River on the North Coast of Central America.
BLACK River, 1838.

Australasia. WALLACE (A. R.), 1893. Malaysia and the Pacific Archipelago. GUILLEMARD (F. H. H.), 1894. Add. 505.

—— Guide to Australasia and itinerary to and in the colonies of Victoria, New South Wales, Queensland, South Australia, Western Australia, Tasmania, and New Zealand. SILVER (S. W.) and Co., 1863, 1864, p. 199.

Australia. JOURNET, 1885. Formation, progress, and present state. FAIRFAX, 1852. Present conditions and future prospects. PARKES (Sir H.), 1880.

—— How to settle in Australia. AUSTRALIA, 1848.

—— Sidney's Australian handbook. Information to intending emigrants. SIDNEY (S. and J.), 1848.

—— Twenty years' experience in. AUSTRALIA, 1839.

—— Year Book. AUSTRALIA, 1886–90.

Australia (South). FORSTER, 1866.

—— South Australia Colony. An account. SINNETT (F.), 1862.

—— South Australia Blue Books, 1889, &c. Revenue and Expenditure, 1867. Statistical Register, &c., 1866.
SOUTH Australia.

—— South Australia: its history, etc. STOW (J. P.), 1883. History resources, productions. HARCUS, 1876.

Australia (Western). FRASER, 1891; HART (F.), 1893. Add. 505.

—— Aboriginal Natives. Report of Committee. WESTERN Australia, 1871. Information. WESTERN Australia, 1871, p. 422.

—— Expedition from De Grey River to Port Darwin. Journal.
WESTERN Australia, 1880.

British Guiana and Venezuela. MATHEWS, 1888.

British Honduras. MORRIS (D.), 1883.

California. Project for English middle and yeoman class colonies.
BRERETON, 1875.

Canada, 1849 to 1859. GALT (A. T.), 1860.

—— Handbook to the Dominion. CANADA, 1883, p. 216.

—— Handbook. SILVER (S. W.) and Co., 1881, p. 199.

—— Information for intending settlers. CANADA, 1882, p. 216.

—— Legislative Assembly Journal. CANADA, 1858, p. 217.

—— Overland Route through British North America: or the shortest road to the East. WADDINGTON (A.), 1868.

—— Quality of land. PICKEN, 1836.

—— Recollections of Canada, Quebec.
CARLILE & Martindale, 1873.

—— Report on, Canada. TANNER (H.), 1883.

COLONIES—*continued.*

Canada. Canadian Tourist. CANADA, 1857. Add. 490.

—— Canadian North West. LORNE, 1881; TASSÉ (E.), 1882. Developed by the Hudson Bay Route. SHELFORD (W.), 1886.

Cape Colony, Natal, Dutch Republics. HALL (Henry), F.R.G.S., 1876. Oudtshoorn Division. Report, 1877. OUDTSHOORN.

Cape of Good Hope and its dependencies. Directory. SOLOMON (S.) and Co., 1883–6.

—— History. Productions and resources. CAPE Colony, p. 220.

Ceylon. An account of the island, etc. TENNENT (Sir J. E.), 1860. Eastern Province. Minute. WARD (Sir H. G.), 1856.

Cyprus. Reports by H. M.'s High Commissioner, 1880–87. CYPRUS.

—— Reports to the Admiralty on the Anchorages. CYPRUS, 1879.

—— Report on the Locust Campaign, 1883, 1886–7. CYPRUS.

French Colonies, 1870. FRANCE, p. 436.

Hong Kong. Restrictions laid upon Chinese Merchants, 1881. HONG KONG, 1881.

India. *See* GEOGRAPHY.

Malta and its Industries. ZAMMIT (N.), 1886.

Manitoba. CHESSON, 1872; MANITOBA, 1882. Manitoba and the Great North West. MACOUN, 1883.

Melbourne, Old. Description of Cyclorama, also Handbook to Aquarium, Picture Galleries, and Museum Collection in the Exhibition Buildings. MELBOURNE, 1894. Add. 519.

—— Report on the Extension of Melbourne Westward. MELBOURNE, 1887.

Moreton Bay, Queensland. Improvement of Northern portion. MORETON Bay, 1877.

Natal. HOLLIDAY, 1865.

—— Address of the President of the Statistical Commission appointed to prepare a Guide Book to Natal. SHEPSTONE (Sir T.), 1867.

New Brunswick, Nova Scotia and Prince Edward's Island. MONRO (A.), 1855.

New South Wales. FIELD (B.), 1825; REID (G. H.), 1876; WALKER (C.), 1886. New South Wales, the oldest and richest of the Australian Colonies. ROBINSON (C.), 1873; in 1881. RICHARDS (T.), 1882. Photographs. NEW SOUTH WALES, p. 400.

—— Aldine Centennial History. MORRISON (W. F.), 1888.

—— Blue Book, progress, resources, etc. NEW SOUTH WALES, 1876, '83, '86, '91, p. 401.

COLONIES—*continued.*

New South Wales. Expedition for the Exploration of the Country lying between Rockingham Bay and Cape York. CARRON, 1849.

—— Gazetteer and Road Guide. WHITWORTH (R. P.), 1866.

—— Progress and Resources. ROBINSON (C.), 1877.

—— Sands' County Directory and Gazetteer for 1881–2. TINGLE (J.), 1881.

—— Voyage from New South Wales to the North Coast of Australia. NAPIER (F.), 1875.

—— Wealth and Progress. COGHLAN (T. A.), 1890–93.

—— New South Wales, Victoria, and South Australia; their Pastures, Copper Mines and Goldfields. SIDNEY (S.), 1853.

New Zealand. REID (J. S.), 1883; BRADSHAW (J.), 1883. Colonial Industries, 1873. NEW ZEALAND, p. 410.

—— Correspondence with the Agent-General, 1872–75. NEW ZEALAND, p. 408

—— Expediency of forming Settlements on the West Coast, 1868. NEW ZEALAND, p. 412.

—— Handbook. HECTOR, 1883, '86; VOGEL (Sir J.), 1885.

—— Import, Export and Shipping Returns, Customs Revenue, 1870. NEW ZEALAND, p. 413.

—— Introduction of Chinese Labour, 1872. NEW ZEALAND, p. 410.

—— Parliamentary Debates, 1870. NEW ZEALAND, p. 410.

—— Physical Geography, Geology, and Natural History. HOCHSTETTER, 1867.

—— Visit for the Examination of certain Lands there during 1883–84. SUTTER (A.), 1887.

—— New Zealand Company Report, 1844. NEW ZEALAND, p. 413.

Ottawa Colonial Conference, Proceedings of, and Report by Earl of Jersey. OTTAWA, 1894. Add. 524.

Queensland the Progressive. WHITE (J. C.), 1870. Resources of. BONWICK, 1883.

St. Helena, Description of the Island. MELLISS, 1875. Geographical Plan of the Island and Forts. READ (R. P.), 1815. Add. 530.

Sierra Leone. Report on the state of the Colony. SIERRA LEONE, 1803.

Stewart's Island, N.Z. Papers and Reports. STEWART'S ISLAND, 1872.

Tasmania. Products and Resources. WHITING (G.), 1862.

Transvaal Handbook. SILVER (S. W.) & Co., 1878, p. 200.

Trinidad, a field for emigration. CLARK (H. J.), 1886.

—— Almanack. GUPPY, 1869.

Victoria. Aborigines, with notes on the natives of other parts of Australia and Tasmania. SMYTH (R. B.), 1878.

COLONIES—*continued.*

Victoria. History, Geography, Climate, Government, etc. LEVEY, 1883.

—— Internal Communication. Report of the Commission. VICTORIA, 1854, p. 375.

—— Report on its condition and progress since the discovery of the goldfields. VICTORIA, 1853, p. 375.

—— Public Lands. Return of the extent of their sale and the amount realised. VICTORIA, 1858, p. 376.

—— Victoria in 1854, with remarks on the geology of the Australian goldfields. WATHEN (G. H.), 1855.

Victoria, Central America. The new British Colony. VICTORIA, C.A., 1840, p. 379.

Wellington, N.Z. Calendar, Almanack, Directory, etc., for 1883. WELLINGTON, N.Z., 1882.

Winnipeg, Souvenir of. WINNIPEG, 1884.

COLONISATION.

America. Proposed Railway Communication from the Atlantic to the Pacific in the territories of British North America. DOULL, 1851.

Canada: extensive and systematic colonization. DOULL, 1868.

European. ANDREW (Sir W. P.), 1886.

India. CLARKE (H.), 1857.

COLOUR.

Colour in churches, on walls and in windows. SHARPE (E.), 1871.

Colour of thin transparent bodies. JORDAN (C. W.), 1800.

Light and Colour. Lectures. SPICE (R.), 1889.

Photochromoscope. IVES, 1894.

Polychromatic Ornament of Italy. ADAMS (E.), 1849.

Production of Colours. YOUNG (Dr. T.), 1802.

COLOUR BLINDNESS. HERSCHEL (Sir J. F. W.), 1859.

COLOUR VISION. MAXWELL, 1871. Report of Commission, 1892. PARLIAMENTARY..Papers, p. 472.

Circular to the Railway Companies, 1894. PARLIAMENTARY..Papers, p. 472.

COLOURS.

Coal Tar Colours, Chemistry of. BENEDIKT, 1886.

Colours of the Spectrum. MAXWELL, 1860.

Discoveries relating to. PRIESTLEY, 1772.

Light and Colours, Theory of. YOUNG (Dr. T.), 1802.

Theory of Compound Colours. MAXWELL, 1860.

Theory of the three primary colours. MAXWELL, 1861.

COMBUSTION. FICHET, 1874.

Combustion, with special reference to practical requirements. SIEMENS (F.), [1887].

Combustion Products. MÜLLER (F. C. G.), 1891.

Luminous and Non-Luminous Combustion. THWAITE (B. H.), 1891, p. 312.

Mineral Combustibles, Italy. JERVIS (W. P.), 1879.

COMMERCE.

Ancient. History and Principles. GILBART, 1853; LINDSAY, 1874.

Association of Chambers of Commerce. United Kingdom, ASSOCIATION of C. of C.

—— Report of meeting at Huddersfield, Sept. 1894. ASSOCIATION OF Chambers of Commerce, etc. Add. 482.

British Chamber of Commerce, Paris. Law relative to the Residence of Foreigners in France, 1893. Report, 1892. Report on Metals, 1876. PARIS, p. 452.

Duluth, Minnesota, Chamber of Commerce. Report, 1887. DULUTH.

Dictionary. SIMMONDS (P. L.), 1883.

Dictionary of Commerce and Commercial Navigation. McCULLOCH, 1837, '60, '67, '80.

Guide. ANONYMOUS, 1860–74, p. 40.

Influence of, on the civilisation of ancient peoples and on their navies. DUPIN, 1822.

Inland Commerce in France. RODET (D. L.), 1825.

Mercantile Correspondence: French, English, and German. VOGEL (C.), 1885.

Science and Commerce. SIMMONDS (P. L.), 1872.

Tribunals of Commerce. LYNE, 1854.

Belgian Commerce with foreign countries during the years 1831–7. THEUSE de Meylandt (— de).

British Commerce. Handbook. SIMMONDS (P. L.), 1892.

—— Statistics. POOLE (B.), 1852.

—— Commercial power of Great Britain. DUPIN, 1825.

—— Commerce in England and in France. DUPIN, 1822.

European. ODDY, 1805.

France. DUPIN, 1827.

Frankfort-on-Main. Chambers of Commerce. FRANKFORT-ON-MAIN, 1889.

Hague. Chambers of Commerce, 1846. HAGUE.

Mannheim. Chamber of Commerce. MANNHEIM, 1888.

Mississippi River. Commerce. MORGAN (G. H.), 1893. Add. 521.

COAL MINES (LEGISLATION)—*continued.*

Coal Mines Regulation Act, 1887. Bill to extend the Act to the Iron Ore Mines of Cumberland and Lancashire. CUMBERLAND, 1888.

—— Return of Prosecutions, 1890. PARLIAMENTARY..Papers, p. 472.

—— Bill to amend, 1891. PARLIAMENTARY..Papers, p. 472.

Handbook of the law and leading cases. FOWLER (J. C.), 1872.

Laws regulating the working. ABEL (Sir F. A.), 1889.

COAL MINES (LIGHTING).

How to light a Colliery with Electricity. WALKER (S. F.), 1892.

Safety Lamps. BAGOT (A. C.), 1879; BELGIUM, 1843, p. 116; DAVY (Sir H.), Works, vol. 6; DAVY, 1818; HALL (T. Y.); MARSAUT, 1883. Construction and comparative merits. BAGOT (A. C.), 1879. Magnetic fastening. RAFFARD, 1889.

—— Experiments at Aldwarke Main Colliery, 1884. MIDLAND Institute of..Engineers.

—— Priority of invention. CLANNY, 1844.

—— Davy's lamp demonstrated to be insecure by chemical experiments, and the perfect security of Upton and Roberts' new safety lamp proved. UPTON (G.), and Roberts, 1833.

—— Elvin Safety Lamp. HEMPTINNE, 1847.

—— Marsaut Safety Lamp. DICKINSON (J.), 1883.

—— Miners' Safety Lamps. MARSAUT, 1883, '84.

—— Mueseler's and Dr. Reid Clanny's. MUESELER, 1843.

—— Patent Safety Lamp. YATES (W.), 1870.

COAL MINES (VALUATION OF). HOSKOLD, 1877; LACRETELLE, 1870.

COAL MINES (VENTILATION). BRUNTON (W.), 1849.

Furnace and Steam Jet. Their relative value in the ventilation of Coal Mines. WOOD (N.), 1853.

Plan for ventilating. MARTIN (John), 1849.

South Staffordshire. Ventilation. GIBBONS (B.), 1847.

Treatise on the Gases met with in Coal Mines. ATKINSON (J. J.), 1879.

Ventilating and Working. RAMSAY (J. A.), 1882.

Ventilation. Principles and practice. BAGOT (A. C.), 1879, 1882; STRUVÉ (W. P.), 1852.

COAL MINES (WORKING). DEMANET, 1859. Coal working at a depth of less than 1000 meters. DEVILLEZ, 1859. Working and Ventilation. HEDLEY, 1851.

Belgium, France, Germany and England. Explanation of comparative methods employed. PONSON, 1852–54, 1867.

COAL MINES (WORKING)—*continued.*

Coal Mining Plant, Working Drawings. POVEY-HARPER.
Coal Viewer and Engine Builder's Practical Companion. CURR, 1797.
Colliery Machinery. PERCY (C. M.), 1890.
Colliery Management. HYSLOP, 1876.
Colliery Manager's Handbook. PAMELY, 1891.
Colliery Manager's Pocket Book, 1876. HUTCHINGS.
Inspection. BOYD (R. N.), 1879.
Liége district. MALHERBE, 1863.
Longwall method of Working. GARFORTH, 1885; WAIN, 1892.
Mechanical Engineering of Collieries. PERCY (C. M.), 1885–6.
New South Wales. Progress and report from Select Committee on Working of Collieries, etc., 1894. NEW SOUTH WALES. Add. 522.
Screening, transport, etc. DANVERS, 1872.
Thompson's Inventions, Improvements, etc., in the combined practice of Colliery Engineer and General Manager, with discussion on the Coal Trade Regulations. THOMPSON (Ben), 1847.
Winning and working of Collieries. DUNN (M.), 1852.

COAL MINING.

Coal and Coal Mining. SMYTH (Sir W. W.), 1867, '72; WALTON (T. H.), 1885.
Glossary of Terms. GRESLEY, 1883.
Haulage of Coal. BAINBRIDGE, 1869.
—— Underground haulage of Coal by Wire Ropes. HILDENBRAND, 1884.
Historical account. EDINGTON, 1814.
Mining Coal by Compressed Lime. SMYTH (Sebastian), 1882.
Practical treatise. ANDRÉ, G. G., 1875–76.
Shot firing in Mines. GALLOWAY (W.), 1888.
Text Book. HUGHES (H. W.), 1892.
Theory and practice. FOWLER (G.), 1870.
Use of explosives. KROHN, 1893.
Winding and Overwinding. PERCY (C. M.), 1880.
Belgium, since 1865. DUJARDIN-BEAUMETZ, 1888.
France, since 1865. DUJARDIN-BEAUMETZ, 1888.
India, 1869. INDIA, p. 99; Coal mining by blasting in the Bengal Coalfield. DOYLE, 1885.
Pennsylvania Coal-Waste Commission. PENNSYLVANIA, 1893.
United Kingdom. Relative dangers of Coal and Metal Mining in the United Kingdom. FOSTER (C. Le. N.), 1885.
—— Great Britain. History. GALLOWAY (R. L.), 1882.
—— England, since 1865. DUJARDIN-BEAUMETZ, 1889.

COAL TAR.

Account of Specimens of Coal Tar products shown at the Exhibition of the Philosophical Society, Glasgow, 1880.
BOULTON (S. B.), 1882. Add. 486.

Past, Present and Future of Coal Tar.
WILLIAMS (Greville), 1883. Add. 539.

COAL TRADE. ANONYMOUS, 1830, p. 42; ANONYMOUS, 1830, p. 45; BOYD (R. N.), 1892; EDINGTON, 1814.

Bessèges, Colliery Company. Provision for succour and assistance.
MARSAUT, 1889.

Comparative commercial values of Gas-Coal and Cannels.
GRAHAM (D. A.), 1882.

Cumberland (West). FLETCHER (I.), 1878.

London, Port of. Act and Amended Act for the sale of Coal in the Port of London, 1807. LONDON, p. 255.

—— Bye-laws for regulating Vessels laden with Coals, 1838.
LONDON, p. 255.

—— Observations on the duty of sea-borne Coal, 1831.
LONDON, p. 255.

—— Coal Trade (Port of London) Bill. Reports from the Select Committee, 1838. LONDON, p. 255.

—— Annual average price per ton of the best coals at the ship's side in the Port of London, 1881–89. LONDON, p. 255.

—— Taxation of Coals. HARDIE (1793).

New York State. Distribution, classification and cost delivered over different routes. NEW YORK STATE, 1866.

Northumberland and Durham. Glossary of Terms.
GREENWELL (G. C.), 1888.

Ohio River. Transportation of Coal. BOGART, 1892.

Rhine (Lower) and Westphalia. Coal Industry.
NATORP, 1880.

United Kingdom. MEADE (R.), 1879.

—— Evidence on the state of the Coal Trade. SYKES (J.), 1829.

—— England. GARDINER (R.), 1796.

—— England and Wales. Report of Select Committee, 1800.
PARLIAMENTARY..Papers, p. 471.

—— —— Report of Select Committee, 1836.
PARLIAMENTARY..Papers, p. 471.

—— Great Britain and Ireland. Potts' Mining Register and Directory for the Coal Trades, etc.
PERIODICAL PUBLICATIONS, p. 21.

—— Great Britain. ANONYMOUS, 1841, p. 46.

—— Wales (South) Coal trade and its allied industries.
WILKINS (C.), 1888.

—— Warwickshire and Staffordshire, Injury to, by the unequal charges on the Grand Junction Canal. DURELL, 1845.

COAL STRIKES. *See* STRIKES.

COASTS AND COAST WORKS. CORNAGLIA, 1888, '91.

Coast erosion. Recent Enquiries into.
BOURDILLON (J. W.), 1886. Add. 486.

Is the sea-shore free to all? ANONYMOUS, 1884. Add. 48.

Rights of the Crown and Privileges of the subject in the Sea-Shores. HALL (R. G.), 1875.

Baltic. Rising and Sinking of the Prussian Coasts.
HAGEN (G.), 1866.

—— Dune works on. KRAUSE, 1850.

Belgium. MEY, 1885.

Dover (Straits of). Erosion of the coasts of, and the possibility of their protection. MARCHAL (L.), 1881. Add. 518.

England, South Coast of. Alluvial formations and local changes.
REDMAN (J. B.), 1854.

England and Scotland. Survey. COLLINS (Capt. G.), 1693.

England and Wales, erosion. BRITISH ASSOCIATION, 1886–88.

France, Coasts of, their secular transformation.
GIRARD (J.), 1881. Add. 503.

—— France, Sea-shores of. Changes.
GIRARD (J.), 1888. Add. 503.

—— Swelling and Depression of the soil on the coasts.
GIRARD (J.), 1876. Add. 503.

—— Vibrations. DELESSE, 1872.

Ireland. Nautical Descriptions. MACKENZIE (M.), 1776.

Lengo and Barcola, Sea breach between. ROSENKART, 1860.

New Jersey Coast, Beach protection. Littoral Movements of the, and jetty reaction. HAUPT (L. M.), 1890.

Norfolk Coast. Encroachments of the German Ocean.
HEWITT (W.), 1844. Add. 507.

Scotland. Orkney and Lewis Island. MACKENZIE (M.), 1791.

—— West Coasts and Western Islands. MACKENZIE (M.), 1775.

Yorkshire. PHILLIPS (J.), 1853.

See also SEA DEFENCES.

COBALT ORE. Flintshire. FOSTER (C. Le N.), 1881.

COCO-NUT TREE. Natural and economical History.
MARSHALL (H.), 1832.

COFFERDAMS. Cofferdam or Caisson without timber or iron in its construction. HARRIS (R. L.), 1891.

Description of a portable one adapted for the use of harbours and marine works in exposed positions. STEVENSON (T.), 1858.

Description of the Coffer Dam used at Davis Island Dam.
MARTIN (W.), 1881.

See also CAISSONS.

COINAGE. *See* MEASURES.

COKE.

Coke from Turf. Statement respecting the method and cost of producing. VIGNOLES (C. B.), 1850.

Heating properties of coke and coal compared. PELLATT (A.) [1857].

Manufacture of, and collection of bye-products by the Simon-Carvés process. BRECKON, 1884.

Preparation of, for the manufacture of cast iron. CRACE-CALVERT.

Use of improved, for obtaining increased strength of Cast Iron. CRACE-CALVERT, 1855.

New South Wales. Report on Manufacture of Coke. NEW SOUTH WALES, 1890, p. 401.

Semet-Solvay Coke Oven, with recovery of bye-products. DEMANET, 1890.

COLD AND REFRIGERATION. OELWEIN, 1891.

Artificial production of Ice and Cold. PAUL (B. H.), 1869.

Different systems of refrigeration. PERROT (S. DE), 1893.

Distribution in America. GUTERMUTH, 1892.

Freezing Process. POETSCH, 1886.

Ice-making machines. LEDOUX, 1879.

Manufacture of Ice by the Bath process. BAGSHAWE, 1886.

Mechanical Refrigeration of Air and its Applications. LIGHTFOOT, 1885.

Mechanical Refrigeration. DE LA VERGNE, 1883.

Preservation of Foods by Cold. LIGHTFOOT, 1881; POSTLE, 1882.

Refrigerating Machines. SCHRÖTER, 1887, '90. Pontifex Machines. COLLINGWOOD, Martin and Abbott, 1887.

Theory of regelation. LE CHATELIER (H.), 1892.

COLLEGES. *See* UNIVERSITIES, Colleges, Schools, etc.

COLLISIONS AT SEA. Regulations for prevention. GRAY (T.), 1867.

COLONIES.

British Enterprise beyond the Sea. BANNISTER (S.), 1849.

Colonial Questions pressing for immediate solution. MACFIE (R. A.), 1870.

Colonies at home providing for the poor population of Ireland by the cultivation of the soil. ALLEN (W.), 1832.

Colonies of the British Empire. History. MARTIN (R. M.), 1843.

Emigration to British Colonies. BATE, 1862.

England and her Colonies. FROUDE, 1886.

Imperial federation of Great Britain and her Colonies. YOUNG (F.), 1876.

Africa (South). Handbook. SILVER (S. W.) and Co., 1875, p. 199.

COLONIES—*continued.*

America (Central). Proposed Colony in the district of Black River on the North Coast of Central America. BLACK River, 1838.

Australasia. WALLACE (A. R.), 1893. Malaysia and the Pacific Archipelago. GUILLEMARD (F. H. H.), 1894. Add. 505.

—— Guide to Australasia and itinerary to and in the colonies of Victoria, New South Wales, Queensland, South Australia, Western Australia, Tasmania, and New Zealand. SILVER (S. W.) and Co., 1863, 1864, p. 199.

Australia. JOURNET, 1885. Formation, progress, and present state. FAIRFAX, 1852. Present conditions and future prospects. PARKES (Sir H.), 1880.

—— How to settle in Australia. AUSTRALIA, 1848.

—— Sidney's Australian handbook. Information to intending emigrants. SIDNEY (S. and J.), 1848.

—— Twenty years' experience in. AUSTRALIA, 1839.

—— Year Book. AUSTRALIA, 1886–90.

Australia (South). FORSTER, 1866.

—— South Australia Colony. An account. SINNETT (F.), 1862.

—— South Australia Blue Books, 1889, &c. Revenue and Expenditure, 1867. Statistical Register, &c., 1866. SOUTH Australia.

—— South Australia: its history, etc. STOW (J. P.), 1883. History resources, productions. HARCUS, 1876.

Australia (Western). FRASER, 1891; HART (F.), 1893. Add. 505.

—— Aboriginal Natives. Report of Committee. WESTERN Australia, 1871. Information. WESTERN Australia, 1871, p. 422.

—— Expedition from De Grey River to Port Darwin. Journal. WESTERN Australia, 1880.

British Guiana and Venezuela. MATHEWS, 1888.

British Honduras. MORRIS (D.), 1883.

California. Project for English middle and yeoman class colonies. BRERETON, 1875.

Canada, 1849 to 1859. GALT (A. T.), 1860.

—— Handbook to the Dominion. CANADA, 1883, p. 216.

—— Handbook. SILVER (S. W.) and Co., 1881, p. 199.

—— Information for intending settlers. CANADA, 1882, p. 216.

—— Legislative Assembly Journal. CANADA, 1858, p. 217.

—— Overland Route through British North America: or the shortest road to the East. WADDINGTON (A.), 1868.

—— Quality of land. PICKEN, 1836.

—— Recollections of Canada, Quebec. CARLILE & Martindale, 1873.

—— Report on, Canada. TANNER (H.), 1883.

COLONIES—*continued.*

Canada. Canadian Tourist. CANADA, 1857. Add. 490.

—— Canadian North West. LORNE, 1881; TASSÉ (E.), 1882. Developed by the Hudson Bay Route. SHELFORD (W.), 1886.

Cape Colony, Natal, Dutch Republics. HALL (Henry), F.R.G.S., 1876. Oudtshoorn Division. Report, 1877. OUDTSHOORN.

Cape of Good Hope and its dependencies. Directory. SOLOMON (S.) and Co., 1883–6.

—— History. Productions and resources. CAPE Colony, p. 220.

Ceylon. An account of the island, etc. TENNENT (Sir J. E.), 1860. Eastern Province. Minute. WARD (Sir H. G.), 1856.

Cyprus. Reports by H. M.'s High Commissioner, 1880–87. CYPRUS.

—— Reports to the Admiralty on the Anchorages. CYPRUS, 1879.

—— Report on the Locust Campaign, 1883, 1886–7. CYPRUS.

French Colonies, 1870. FRANCE, p. 436.

Hong Kong. Restrictions laid upon Chinese Merchants, 1881. HONG KONG, 1881.

India. *See* GEOGRAPHY.

Malta and its Industries. ZAMMIT (N.), 1886.

Manitoba. CHESSON, 1872; MANITOBA, 1882. Manitoba and the Great North West. MACOUN, 1883.

Melbourne, Old. Description of Cyclorama, also Handbook to Aquarium, Picture Galleries, and Museum Collection in the Exhibition Buildings. MELBOURNE, 1894. Add. 519.

—— Report on the Extension of Melbourne Westward. MELBOURNE, 1887.

Moreton Bay, Queensland. Improvement of Northern portion. MORETON Bay, 1877.

Natal. HOLLIDAY, 1865.

—— Address of the President of the Statistical Commission appointed to prepare a Guide Book to Natal. SHEPSTONE (Sir T.), 1867.

New Brunswick, Nova Scotia and Prince Edward's Island. MONRO (A.), 1855.

New South Wales. FIELD (B.), 1825; REID (G. H.), 1876; WALKER (C.), 1886. New South Wales, the oldest and richest of the Australian Colonies. ROBINSON (C.), 1873; in 1881. RICHARDS (T.), 1882. Photographs. NEW SOUTH WALES, p. 400.

—— Aldine Centennial History. MORRISON (W. F.), 1888.

—— Blue Book, progress, resources, etc. NEW SOUTH WALES, 1876, '83, '86, '91, p. 401.

COLONIES—*continued.*

New South Wales. Expedition for the Exploration of the Country lying between Rockingham Bay and Cape York. CARRON, 1849.

—— Gazetteer and Road Guide. WHITWORTH (R. P.), 1866.

—— Progress and Resources. ROBINSON (C.), 1877.

—— Sands' County Directory and Gazetteer for 1881–2. TINGLE (J.), 1881.

—— Voyage from New South Wales to the North Coast of Australia. NAPIER (F.), 1875.

—— Wealth and Progress. COGHLAN (T. A.), 1890–93.

—— New South Wales, Victoria, and South Australia; their Pastures, Copper Mines and Goldfields. SIDNEY (S.), 1853.

New Zealand. REID (J. S.), 1883; BRADSHAW (J.), 1883. Colonial Industries, 1873. NEW ZEALAND, p. 410.

—— Correspondence with the Agent-General, 1872–75. NEW ZEALAND, p. 408

—— Expediency of forming Settlements on the West Coast, 1868. NEW ZEALAND, p. 412.

—— Handbook. HECTOR, 1883, '86; VOGEL (Sir J.), 1885.

—— Import, Export and Shipping Returns, Customs Revenue, 1870. NEW ZEALAND, p. 413.

—— Introduction of Chinese Labour, 1872. NEW ZEALAND, p. 410.

—— Parliamentary Debates, 1870. NEW ZEALAND, p. 410.

—— Physical Geography, Geology, and Natural History. HOCHSTETTER, 1867.

—— Visit for the Examination of certain Lands there during 1883–84. SUTTER (A.), 1887.

—— New Zealand Company Report, 1844. NEW ZEALAND, p. 413.

Ottawa Colonial Conference, Proceedings of, and Report by Earl of Jersey. OTTAWA, 1894. Add. 524.

Queensland the Progressive. WHITE (J. C.), 1870. Resources of. BONWICK, 1883.

St. Helena, Description of the Island. MELLISS, 1875. Geographical Plan of the Island and Forts. READ (R. P.), 1815. Add. 530.

Sierra Leone. Report on the state of the Colony. SIERRA LEONE, 1803.

Stewart's Island, N.Z. Papers and Reports. STEWART'S ISLAND, 1872.

Tasmania. Products and Resources. WHITING (G.), 1862.

Transvaal Handbook. SILVER (S. W.) & Co., 1878, p. 200.

Trinidad, a field for emigration. CLARK (H. J.), 1886.

—— Almanack. GUPPY, 1869.

Victoria. Aborigines, with notes on the natives of other parts of Australia and Tasmania. SMYTH (R. B.), 1878.

COLONIES—*continued.*

Victoria. History, Geography, Climate, Government, etc. LEVEY, 1883.

—— Internal Communication. Report of the Commission. VICTORIA, 1854, p. 375.

—— Report on its condition and progress since the discovery of the goldfields. VICTORIA, 1853, p. 375.

—— Public Lands. Return of the extent of their sale and the amount realised. VICTORIA, 1858, p. 376.

—— Victoria in 1854, with remarks on the geology of the Australian goldfields. WATHEN (G. H.), 1855.

Victoria, Central America. The new British Colony. VICTORIA, C.A., 1840, p. 379.

Wellington, N.Z. Calendar, Almanack, Directory, etc., for 1883. WELLINGTON, N.Z., 1882.

Winnipeg, Souvenir of. WINNIPEG, 1884.

COLONISATION.

America. Proposed Railway Communication from the Atlantic to the Pacific in the territories of British North America. DOULL, 1851.

Canada: extensive and systematic colonization. DOULL, 1868.

European. ANDREW (Sir W. P.), 1886.

India. CLARKE (H.), 1857.

COLOUR.

Colour in churches, on walls and in windows. SHARPE (E.), 1871.

Colour of thin transparent bodies. JORDAN (C. W.), 1800.

Light and Colour. Lectures. SPICE (R.), 1889.

Photochromoscope. IVES, 1894.

Polychromatic Ornament of Italy. ADAMS (E.), 1849.

Production of Colours. YOUNG (Dr. T.), 1802.

COLOUR BLINDNESS. HERSCHEL (Sir J. F. W.), 1859.

COLOUR VISION. MAXWELL, 1871. Report of Commission, 1892. PARLIAMENTARY..Papers, p. 472.

Circular to the Railway Companies, 1894. PARLIAMENTARY..Papers, p. 472.

COLOURS.

Coal Tar Colours, Chemistry of. BENEDIKT, 1886.

Colours of the Spectrum. MAXWELL, 1860.

Discoveries relating to. PRIESTLEY, 1772.

Light and Colours, Theory of. YOUNG (Dr. T.), 1802.

Theory of Compound Colours. MAXWELL, 1860.

Theory of the three primary colours. MAXWELL, 1861.

COMBUSTION. FICHET, 1874.

Combustion, with special reference to practical requirements. SIEMENS (F.), [1887].

Combustion Products. MÜLLER (F. C. G.), 1891.

Luminous and Non-Luminous Combustion. THWAITE (B. H.), 1891, p. 312.

Mineral Combustibles, Italy. JERVIS (W. P.), 1879.

COMMERCE.

Ancient. History and Principles. GILBART, 1853; LINDSAY, 1874.

Association of Chambers of Commerce. United Kingdom, ASSOCIATION of C. of C.

—— Report of meeting at Huddersfield, Sept. 1894. ASSOCIATION OF Chambers of Commerce, etc. Add. 482.

British Chamber of Commerce, Paris. Law relative to the Residence of Foreigners in France, 1893. Report, 1892. Report on Metals, 1876. PARIS, p. 452.

Duluth, Minnesota, Chamber of Commerce. Report, 1887. DULUTH.

Dictionary. SIMMONDS (P. L.), 1883.

Dictionary of Commerce and Commercial Navigation. McCULLOCH, 1837, '60, '67, '80.

Guide. ANONYMOUS, 1860–74, p. 40.

Influence of, on the civilisation of ancient peoples and on their navies. DUPIN, 1822.

Inland Commerce in France. RODET (D. L.), 1825.

Mercantile Correspondence: French, English, and German. VOGEL (C.), 1885.

Science and Commerce. SIMMONDS (P. L.), 1872.

Tribunals of Commerce. LYNE, 1854.

Belgian Commerce with foreign countries during the years 1831–7. THEUSE de Meylandt (— de).

British Commerce. Handbook. SIMMONDS (P. L.), 1892.

—— Statistics. POOLE (B.), 1852.

—— Commercial power of Great Britain. DUPIN, 1825.

—— Commerce in England and in France. DUPIN, 1822.

European. ODDY, 1805.

France. DUPIN, 1827.

Frankfort-on-Main. Chambers of Commerce. FRANKFORT-ON-MAIN, 1889.

Hague. Chambers of Commerce, 1846. HAGUE.

Mannheim. Chamber of Commerce. MANNHEIM, 1888.

Mississippi River. Commerce. MORGAN (G. H.), 1893. Add. 521.

COMMERCE—*continued.*

Nova Scotia. Chamber of Commerce. Report, 1877, '79. NOVA SCOTIA.

Philadelphia. Report. PHILADELPHIA, 1880, p. 34.

Prince of Wales's Island, Singapore and Malacca. PRINCE of Wales's Island, 1857.

Rouen. Chamber of Commerce, 1849–52. MIRE, 1853.

Swansea, the commercial centre of S. Wales. SWANSEA, 1881.

Switzerland. Manufactures of. SWITZERLAND, 1836. Report on commerce. BOWRING (J.), 1836. App. 549.

United States. Inter-state Commerce. FINK, 1882, '85.

—— Inter-State Commerce Bill. BROUGHTON (F.), 1886.

—— United States Commerce as related to that of other countries. BATES (W. W.), 1893. Add. 484.

—— Reports, Commercial Relations, etc. UNITED STATES, p. 343.

See also ARTS AND MANUFACTURES, INDUSTRIES, MANUFACTURES, TRADE.

COMMISSIONS. Commissions, mercantile and professional. Published Correspondence on. STORR (J. S.), 1877.

COMMONS AND WASTE LANDS. ELTON, 1868.

COMPANIES.

Act for Consolidating Acts on the Constitution of Companies, 1845. PARLIAMENTARY..Papers, p. 473.

Companies Act and Amended Act, 1862, 67. PARLIAMENTARY..Papers, p. 473.

Report of Registrar of Joint Stock Companies, 1846. PARLIAMENTARY..Papers, p. 473.

Return of Joint Stock Companies, 1846. PARLIAMENTARY..Papers, p. 473.

See also CHARTERED Companies.

COMPANIES (CITY). London. Carpenters' Company. JUPP, 1848.

COMPASS (MAGNETIC). ALLEN, T. (1855).

Compass. Historical, theoretical and practical. WILSON-BARKER (D.), 1892.

Application of "Native Alloy" for the pivots of Magnetic Compasses. JOHNSON (E. J.), 1840.

Azimuth (Patent) and Steering Compass, invented by Dent. DENT, 1844; DENT, 1844. App. 554.

Compass Adjustment. LE COUTEUR, 1893.

Daily variation of the horizontal and dipping needles under a reduced directive action. BARLOW (P.), 1823. App. 547.

Declination and inclination of the Magnetic Needle. LORIMER, 1795.

COMPASS (MAGNETIC)—*continued.*

Deviations of the Compass. MADAMET, 1882.

—— on shipboard. BARLOW (P.), 1824.

—— necessity for ascertaining the Deviations of the Compass. JOHNSON (E. J.), 1852; SCORESBY (W.), 1822.

Diurnal deviations of the Horizontal Needle when under the influence of Magnets. CHRISTIE (S. H.), 1823. App. 552.

Iron. Compass in Iron Ships. AIRY, Sir G. B., 1866, p. 16; SCORESBY (W.), 1854. Magnetical errors. AIRY, Sir G. B. (1865), p. 19; FAIRBAIRN (Sir W.), etc., p. 404.

—— Magnetism of Iron Ships. AIRY, Sir G. B. 1865, p. 17.

—— Various ways in which it affects the Compass. LYONS, 1884.

—— Rules for ascertaining the Deviations of the Compass caused by the iron of a ship. ANONYMOUS, 1852, 1855, p. 52.

Johnson and the Mariner's Compass. JOHNSON (Capt. E. J.), 1848. App. 563.

Liverpool Compass Committee. Report. LIVERPOOL, 1857–61, p. 246.

Magnetic Needle and the Aurora Borealis. Combined motions of. BROUN (J. A.), 1850.

—— Use of the magnetic needle in exploring for iron ore. BROUGH, 1887.

Magnetic Variation of the Needle. FENWICK (T.), 1861.

Meridional and azimuth compass. WALKER (Ralph), 1794.

COMPENSATION. Law of Compensations under the Lands and Railways Clauses Acts. WORDSWORTH (C. F. F.), 1863.

CONCRETE. Combination of Iron and Concrete for Building purposes. EDWARDS (F. G.), 1891, '94.

Essay. TREUSSART (Gen.), etc., 1842.

Formation of Concrete. HAWKINS (J. I.), 1843.

Lining a Waterworks Tunnel with Concrete. FITZGERALD (D.), 1894. Add. 500.

Manufacture of Concrete. Remarks on its application to the construction of gasholder tanks. SANDEMAN (J. W.), 1877. Add. 532.

Nature and Properties of. GODWIN, 1836.

Nature and Uses. SUTCLIFFE (G. L.), 1893.

Newhaven Fort, Concrete Revetments built at. ARDAGH (J. C.), 1866. Add. 481.

Portland Cement Concrete, combined with Iron, as a Building Material. HYATT, 1877.

Use in Building. POTTER (T.), 1877.

Used in the late extension of the London Docks. ROBERTSON (G.), 1860.

Works in Concrete. NEWMAN (J.), 1887, p. 194.

CONCRETE BUILDINGS, WALLING, ETC. Appliances for erecting all classes of. BROUGHTON (T.), 1876. Buildings in Concrete. DRAKE (C.), 1874. Add. 497.

CONCRETE MIXERS.

Double Cone Mixing Machine for Concrete, etc. TAYLOR (R. H.), 1889.

Rotary Washing or Mixing Machine for Sand and other materials. TAYLOR (R. H.), 1885.

CONSERVATORIES, Arrangement of. BURN (R. S.), 1860.

CONSPIRACY (TREASONABLE), Ireland. Report of Committee of Secrecy, 1799. IRELAND, p. 140.

CONSTRUCTION, Economics of. BOW, 1873; GONIN (E.), 1877.

Mechanical principles of construction. MOSELEY, 1863.

Theory applied to the practice of Construction. WRAY (H.), 1872, '91.

See also BUILDING.

CONSULAR GOVERNMENT.

Consular Government between France, England, Italy, Germany and Switzerland. D'Ivernois (Sir F.), 1803. Add. 497.

CONSULAR REPORTS. 1866, 1870–86, 1882–86, 1886, etc. PARLIAMENTARY . . Papers, p. 473.

Commercial Reports by H.M. Consuls in China, 1878–83. PARLIAMENTARY . . Papers, p. 473.

CONTRACTS.

Cost of Contract and day's work. McKIE (H. U.), 1859.

Law of contracts for work and services. GIBBONS (D.), 1857.

COOKERY.

Cooking by Gas. DENNY, 1881.

Scientific Basis, Cantor Lectures. WILLIAMS (W. M.), 1884.

CO-OPERATION. Middlesbrough Co-operative Scheme of Fox, Head and Co., Newport Rolling Mills, 1871–73. FOX, HEAD & CO.

CO-OPERATIVE STORES. Retail traders and Stores. HEAD (J.), 1872.

COPPER.

Bessemerizing Copper Mattes. EGLESTON, 1885.

Chemistry and Metallurgy. PIGGOT, 1858.

Commercial Copper obtained from Enargite. EGLESTON, 1882.

Copper Alloys. STORER (F. H.), 1860.

COPPER—*continued.*

Copper Extraction as carried on in the South of Spain. URQUHART (M. A. P.), 1887.

Copper manufacture. SOPWITH (T.) and Richardson, 1864.

Metallurgy. LAMBORN, 1860; PERCY (J.), [1861].

Preservation of, in sea-water. BECQUEREL (A. C.), 1864.

Use of Copper by the Ancients. RITCHIE (R.), 1852.

Separation of Silver and Gold from black Copper at Oker. EGLESTON, 1885.

Treatment of Copper Slates at Mansfeldt. EGLESTON, 1891.

Weight of seamless Copper Tubes. BROUGHTON Copper Co., 1874.

Working Sheet Copper into all forms. FULLER (J.), 1894.

Cornish Copper Mines. Statement of the accounts of, for the last ten months of 1799. VIVIAN (J.).

Cwm Avon. Reports on the Works at. COMPANY of Copper Mines in England, 1870. Add. 493.

Lake Superior, Copper-bearing rocks of. IRVING (R. D.), 1883.

Spain and Portugal. Copper Mines. RIEKEN, 1857.

United States. REYER, 1886.

COPPER ORES, TREATMENT OF.

Copper Ore from Airthrey in Stirlingshire. Chemical Analysis. THOMSON (T.), 1807.

Low Grade Copper Ores. Economic Treatment of. COLLINS (J. H.), 1893. Add. 493.

Maidanpec wet process for the reduction of certain poor cupreous ores. SYMONS (B.), 1884.

COPPER SMELTING. BEVAN (G. P.), Industries, vol. 1; CLARKE (H.), 1858; HOWE (H. M.), 1885. Swansea district. GRANT-FRANCIS, 1867, 1881. Basic Process as applied to. GILCHRIST (P. C.), 1891.

American method of Smelting Copper. PETERS (E. D.), 1887.

Proceedings of subscribers to the Fund for obviating the inconvenience arising from the smoke. VIVIAN (J.) and Sons, 1800.

Tables showing the difference of the standard at which Copper Ores of various provinces usually sell in Cornwall. DAVEY, 1845.

Tables showing the prices of ores of different produces. EDSALL, 1854.

COPPER TRADE. Tables. PROVIS (J.), 1832.

United Kingdom. Report of Committee, 1800. PARLIAMENTARY . . Papers, p. 473.

COPPER WORKS. Point Shirley [U.S.]. EGLESTON, 1886.

COPYHOLDS. Episcopal Copyholds Co., Durham. Report on the case of Shafto *v.* Bolckow, etc. SHAFTO, 1888.

COPYRIGHT, LAW OF. GODSON, 1823. Analysis. NEWTON (A. V.), 1884.
Copyright of Designs. SPENCE (William), 1847.
Petition against a bill to amend the law relating to. ANONYMOUS, 1840, p. 52.
Question concerning literary property. Millar *v.* Taylor. BURROW, 1773.
Speech on Talfourd's Bill for the Extension of Copyright, 1841. MACAULAY.

CORAL REEFS. Geological Observations. DARWIN, 1851.

CORALS.
Coral Islands. DANA (J. D.), 1879.
Wonders of Coral Life. ICK, 1882.

CORDAGE.
Improved Cordage. AYCKBOURN, 1890.
Improvement in manufacture. HUDDART, 1804.
Inventions in the manufacture. COTTON (W.), 1855.
Manufacture of. CHAPMAN (W.), 1808, p. 243.

CORK. Application of the mechanical properties of, to the Arts. ANDERSON (W.), 1866.

CORN.
France. Advantages that the province of Languedoc has for preserving its grain. PARMENTIER, 1786.
Growth of corn, use of oats, &c. HIBBARD, 1793.
Microscopical examination of wheat and flour. ARAMBURU, 1883.
Prices and fluctuations of Grain, in France and England, 1816–41. RAWSON (R. W.).
St. Petersburg Seaport. Cost of transport. SYTENKO, 1886.
Transport of Corn in South Russia. PONTZEN, 1891.

CORN. Milling. PAPPENHEIM, 1878; WIEBE (F. K. H.), 1861.
Mill Building. SALDINI, 1878.
Application of Frictional Electricity to the Purification of Middlings. GRIMSHAW, 1882.
Flour manufacture. Milling Science and Practice. KICK, 1873, 1888.
Hydraulic Corn Mills. FABRE, 1783.
Machines and Apparatus. KICK, 1873.
Memoir on the millers' and bakers' trade, and the preservation of grain and flour. ROLLET (A.), 1847.

CORN—*continued.*

Miller and constructor of mills. BENOIT, 1863.
Millers', Millwrights' and Engineers' Guide. PALLETT, 1869.
Modern flour mill Insurance. SIMON (H.), 1890.
Modern Milling. GRIMSHAW, 1881.
National Association of British and Irish Millers Reports, 1885–89. NATIONAL Association.
Power of water applied to drive Flour Mills. GLYNN, 1853.
Prevention and extinction of Fires in Flour Mills. CHATTERTON (A.), 1888.
Roller Flour milling. SIMON (H.), 1886, 1891, 1892.

American Corn Milling. ANONYMOUS, 1832, p. 41.
American Millwright and Miller. CRAIK, 1877.
American Miller and Millwright's Assistant. HUGHES (W. C.), 1851, '66.
France, and new applications in Foreign Milling. KREMER, 1881.
Germany. Corn Mills. ARAMBURU, 1885.
Norwich. MYLNE (R.), 1789.
Rio de Janeiro Flour mills and granaries. RIO DE JANEIRO Flour Mills and Granaries Company, 1888.

CORONERS' JURIES. HILDEBRANDT, 1876.

COTTAGE BUILDING. ALLEN (G. B.), 1867.

COTTON. BEVAN (G. P.), Industries, vol. 5.
Bleaching of Cotton. ASHWORTH (1861).
Chemical and Meteorological conditions involved in the successful cultivation. MALLET (J. W.), 1861.
Cotton Baling Presses, with description of the accumulator cotton press. MATHESON, 1870.
Cotton Cultivation. GIBBS (Joseph), 1862.
Cotton Culture and our Educational Interests. WRIGHT (J. W. A.), 1875.
Cotton Famine. Facts of. WATTS (J.), 1866.
Machinery for preparing, roving, and spinning cotton and wool. BODMER (J. G.), 1835.
Manufacture. BROOKS (C. P.), 1888; GELDARD, 1867. History. GUEST, 1823.
—— Cotton Manufacturer's, Manager's and Spinner's Guide. Moss, 1878.
—— Early history in the East. BAINES (E.), 1835.
—— Great Britain. BAINES (E.), 1835; URE (A.), 1836.
—— Indian Cotton, cleaning and quality. Report on Cotton Gins, &c. WATSON (F.), 1879.

COTTON—*continued.*

Manufacture. United States Cotton Manufactures. ATKINSON (E.), 1883.
—— Cotton Manufacture in. WEBBER (S.), [1879].
—— United States manufacture contrasted with that of Great Britain. MONTGOMERY, 1840.
Mills. Report on English Cotton Mills. ATKINSON (E.), 1883.
Plant, Cotton. Report on Climatology. MELL, 1893.

Alabama and Florida. Cotton Production. Report. SMITH (E. A.), 1884.
Brazilian Empire, Cotton in. BRAZIL, 1885. Add. 487.
California, New Mexico, Utah, Arizona, and Mexico. HILGARD, 1884.
Carolina (South), Production of the State of. HAMMOND (H.), 1884.
India. CHAPMAN (J.), 1851.
—— Bengal. Cotton Handbook. INDIA, p. 110.
—— Bombay Presidency. CASSELS, 1862; GRANT (C. W.), 1850; INDIA, p. 111.
—— Madras. Handbook of Cotton Cultivation, 1862. INDIA, p. 122.
Louisiana. HILGARD, 1884.
Mississippi. HILGARD, 1884.
Pegu. Report, 1854. INDIA, p. 128.
Tennessee. Report. SAFFORD (J. M.), 1884.
United States. HILGARD, 1884.
—— Arkansas, Georgia, Missouri, Texas States. Indian Territory. LOUGHRIDGE, 1884.
—— North Carolina. KERR (W. C.), 1884.
—— Virginia. KERR (W. C.), 1884.

COTTON SPINNING. MARSDEN (R.), 1886.
American Cotton Spinner. BAIRD (R. H.), 1866.
Cotton Spinner's Companion. GALBRAITH (G.), 1835.
Machinery for spinning and doubling. BODMER (J. G.), 1837.
Machinery. NASMITH, 1890.
Science of Modern Cotton Spinning. LEIGH (E.), 1873.
Theory and Practice. MONTGOMERY (J.), 1836.

COTTON TRADE.
Considerations. THORP (J.), 1807.
Letters to the Inhabitants of Manchester on the Exportation of Cotton Twist. ANONYMOUS (1800–3), p. 57.
Observations. WALKER (G.), 1803.

COTTON WOOL.
Culture and manufacture of, in India. EAST India Company, 1836.
Machinery for cleaning, carding and spinning.
BODMER (J. G.), 1844.
Yarns (Cotton). Letter on their exportation. SHARP (J. B.), 1817.

COURTS-MARTIAL.
The Mhow Court-martial on Paymaster Smales.
SMALES (T.), 1863.

COW-HOUSES. Rules and regulations for the management of.
HAYWOOD (W.), 1853, p. 33.

CRANES.
Chain for rigging. Specification. ADMIRALTY, 1889.
Cranes and Lifting Machinery. MARKS (E. C. R.), 1892.
Cranes and Machinery for raising heavy bodies. Construction of.
GLYNN, 1849.
Derrick Cranes. Remarks on the advantages and economy of moveable. WIGHTMAN (W.), 1844.
Description of various kinds of. MATHESON, 1879.
Electric Cranes. BOLTON (R.), 1891.
Hydraulic Crane. LUIGGI, 1885.
Steam Crane and 130-ton Crane Seat at Finnieston Quay, Glasgow Harbour. DEAS, 1893.
Travelling Cranes. Componential trusses. SEAMAN (H. B.), 1890.
Treatise. TOWNE (H. K.), 1883.
Wrought-iron tubular cranes designed by William Fairbairn.
BREWSTER, 1852.

CREMATION.
Cremation. SIMON (H.), 1892.
Paris. Crematory at the Cimetière de l'Est. FICHET, 1891.

CREOSOTE.
Creosote. Description of, best suited for creosoting timber.
TIDY (C. M.), 1883.
Creosote oil. CAROLINA Oil & Creosote Co.
Creosote Oils. On the antiseptic Alkaloids contained in.
WILLIAMS (Greville), 1883. Add. 539.
Voelcker's Specification for Creosote. Report on, to the Directors of the Gas Light & Coke Company. TIDY (C. M.), 1885.

CREOSOTING PROCESS. BETHELL, 1851, 1863, 1866.
Patent Improvements in preserving Timber. BETHELL, 1850.

CRIME. Religion and Crime, distresses of the people.
MORGAN (J. M.), 1840.

CRYPTOGRAPHY. New mode of secret writing. ANONYMOUS, 1829, p. 50; NANSOUTY, 1888.

CRYSTALLISATION considered physically and geometrically. BROCHANT de Villiers (A. J. M.), 1819. Add. 488.
Suspended Crystallization. THOMSON (John M.), 1886.

CRYSTALLOGRAPHY. BEN-SAUDE (A.), 1884.
Analcim. BEN-SAUDE (A.), 1881.
Classification of minerals. HANY, 1809.
Conduction of Heat in Crystals. STOKES (Sir G. G.), 1851.
Molecular Constitution. GROTH, 1888.
Perowskit. BEN-SAUDE (A.), 1882.
Study of. LARKIN (N. J.), 1820.
Treatise. MILLER (W. H.), 1839.

CURRENCY.
Bimetallism. BIMETALLIC Conference, 1888; GRENFELL, 1886; KELLEY (W. D.), 1879; INTERNATIONAL Bimetallic Conference, 1894. Add. 511; LAVELEYE, 1881; MOLESWORTH, 1886.
—— A plain statement of the Currency Question, with reasons for restoring Bimetallism. TWIGG (J. H.), 1893.
—— Bimetallic Controversy. GIBBS (H. H.) and Grenfell, 1886; SMITH (Samuel), 1887.
—— English Law of Bimetallism. Reasons for restoring it. TWIGG (J. H.), 1893.
—— The Double Standard. GIBBS (H. H.), 1881.
—— Bi-metallism in England and Abroad. CERNUSCHI, 1879.
—— At 15½, a necessity for the Continent, for the United States, for England. CERNUSCHI, 1881.
Currency Question. Present aspect. NEWTON (A. V.), 1864.
Great Metallic Powers. CERNUSCHI, 1885.
Indian Exchanges. Their proposed restoration. SMITH (Lt.-Col. John Thomas), 1882.
—— Proposed Gold Standard. DOWDEN, 1892.
—— Currency. DOWDEN, 1893; MOLESWORTH, 1893.
Laws and their operation. ANONYMOUS, 1848, p. 43; ANONYMOUS, 1840, p. 43.
Rupee, The. DOWDEN, 1885.
—— Indian Rupee Question and how to solve it. SOWERBY (W.), 1892.
—— Depreciation of the Rupee, 1892. INDIA, p. 100.
Silver Currency. ALLAN (G.), 1892.
Silver and Indian Currency questions. GEORGE (E. M.), 1894.
See also FINANCE.

CURRENTS.
Currents of the Atlantic and Indian Ocean. RENNELL (J.), 1832.
Currents at Sea. MEAD, 1757.
Maury's Current Charts, Guide Book to. TAYLOR (Janet), 1855.
Ocean Currents. VAUGHAN (E.), 1889.
Surface Currents. WHARTON (W. J. L.), 1877.

CURVES. *See* MATHEMATICS (CURVES).

CURVE TABLES. ELB, 1879.
Table for setting out Curves of any Radius by any system of measurement. ARMYTAGE, 1867.
Universal Curve Tables for facilitating the laying out of circular arcs on the ground for railways, canals, etc. RHODES (A.), 1870.
See also RAILWAYS (CURVES).

CUSTOMS.
Laws of the Customs, tariff or customs table. LEES (J.), 1859.
China. CHINA, 1879–84.
France. Code and tariffs, 1804, 1860. FRANCE, p. 436.
Italy. ITALY, 1885, p. 146.
—— (States of the Church). Rates of duties. ITALY, 1815, p. 148.
Queensland. Return. QUEENSLAND, 1879, p. 70.
Trieste. Buildings. BUZZI, 1892.

CUTLERY. BEVAN (G. P.), Industries, vol. 3.

CYCLONES. *See* METEOROLOGY (Storms).

CYCLOPÆDIAS. *See* DICTIONARIES.

CYLINDER, rolling motion of a. MOSELEY, 1851.

D.

DAMS.

Earthen and Masonry, stability of. FARREN, 1889

High Masonry Dams. McMASTER, 1876; PELLETREAU, 1892. Text Book. MERRIMAN, 1892; MOLESWORTH, 1883. Design and construction, giving the method employed in determining the profile of the Quaker Bridge Dam. WEGMANN (E.), 1888. Inspection of the principal dams in France made in 1881. VINCENT (C.), 1881, 1882.

High walls or Dams to resist the pressure of Water. FRANCIS (J. B.), 1888.

Mill dams. Construction of. LEFFEL, 1874.

Movable dams. Barrages mobiles. POIRÉE, 1869.

Torrential rivers, dams across. BRETON (P.), 1867.

Use of Submerged Dams. COMOY, 1861.

Beaufort Dam. BRAND, 1883.

Croton River, U.S. High Masonry dam on the lower part of the. FTELEY, 1890.

France. River Dams or Weirs. HEYWOOD (J. M.), 1869.

Louiche-Desfontaines. TIMINOFF, 1893.

New York. High Masonry Dams. Aqueduct Commission. NEW YORK CITY, p. 405.

Ohio and other Rivers of the United States. Adaptation of Movable dams to the. HAUPT (L. M), 1884.

Sangam Anicut Project, 1890. INDIA, p. 130.

Vehar Lake Dams. Report on, with plans, etc. TULLOCH (H.), 1871.

Vyrnwy Masonry Dam of the Liverpool Waterworks. AITKEN (R.), 1866; CLARKE (Sir A.), 1886.

See also COFFERDAMS, RESERVOIRS (Dams).

DARIEN SCHEME. *See* ATLANTIC and Pacific Oceans.

DAY, Division of the. BROOKS (F.), 1878.

Shortening of the day by the cooling of the earth. LA PLACE, 1821.

DEAF AND DUMB. Convention of American Instructors of the Deaf and Dumb. CONVENTION, 1879.

DECIMAL SYSTEM. *See* MEASURES, Weights and Money.

DECORATION.

Italy. Fine and decorative Arts in. WYATT (M. D.), 1862.
Paris Universal Exhibition, 1856. Report on Furniture and Decorations. WYATT (M. D.), 1856.
—— Arts of decoration at. WYATT (M. D.), 1868.

DEFENCE (NATIONAL). Construction of Batteries for coast defences. RENNIE (G.), 1858.
Construction of Fortifications for the defence of the Dockyards of the United Kingdom, 1867. PARLIAMENTARY..Papers, p. 474.
Cost of new works, 1861–74. PARLIAMENTARY..Papers, p. 474.
Defence of the Country. Speech, 1807. SELKIRK (Earl of).
Defence Commission. PETO (Sir S. M.), 1862.
Defences of the Kingdom. PARNELL (A.), 1882.
French Plan of Invasion. Defiant Defence of Great Britain. McDOUGALL, 1875.
Great Britain. Defensive Policy. JERVOIS, 1871.
—— Great question of the day. HARRIS (Sir W. S.), 1862.
Iron Defences. DOUGLAS (Sir H.), 1860.
—— Use of iron in works of Coast Defence. BARNARD (J. G.), etc., 1871–2.
Letter on Invasion. DRUMMOND, 1859.
Letter to Lord John Russell on. WEALE (J.), 1847.
Organization of the Militia. ADAIR (S.), Baron Waveney, 1859.
Our National Defences. ANONYMOUS, 1852, p. 50; COLES, 1861; SCOTT (Capt.), 1883.
Plan for additional National Defences. MALINS, 1848.
Principles of Reserved Defence applied to detached forts. GRAHAM (G.), 1864.
Remarks on the system proposed by the Royal Commissioners. BOXER, 1862. Answer to Col. Lefroy. BOXER, 1862.
Report of the Commissioners on the Defences of the United Kingdom, 1860–74. PARLIAMENTARY..Papers, p. 474.
Returns relating to National Defences, 1860–62. PARLIAMENTARY..Papers, p. 474.
Royal Defence Commission. COLES, 1862.
System. ANDERSON (Sir J.), 1853; MACINTOSH, 1859.
System of Fortification. FERGUSSON (J.), 1849. Duke of Richmond's plans of Fortification. ANONYMOUS, 1794, p. 50.

America (North). Coast defences. Treatise based on experiences gained in the North American war. SCHELIHA (Lt.-Col. von), 1868.
Australia (South). Colonial Defences. Reports on. SOUTH Australia, 1867, p. 227.

DEFENCE (NATIONAL)—*continued.*

Dover. Paramount importance of, for offensive and defensive warfare. HOSEASON, 1873.

Dungeness. Protection of the roadstead essential to the Navigation of the British Channel. GELL, 1889.

Holland. ANONYMOUS (Ernstige), 1870.

London. ADAIR (S.), Baron Waveney, 1860. Danger and Difficulty of fortifying London, and defence proposed. WILLIAMS (S. H.), 1872. Defence of our Shores and of London, etc. EDDY, 1871. Lines of London defences by works in the field. ADAIR (S.), Baron Waveney, 1862.

New Zealand. Defence. JERVOIS, 1884.

Portsmouth. ADAIR (S.), Baron Waveney, 1860. Peril of Portsmouth. French fleets and English forts. FERGUSSON (J.), 1852.

—— Portsmouth protected. FERGUSSON (J.), 1856.

Spithead Defence. SCOTT (M.), 1862, p. 177. Report to consider the alterations in the plans in consequence of the abandonment of the works on the Sturbridge. SPITHEAD, 1864. Spithead Fortifications. Report of the Commissioners for National Defences on the proposed system. SPITHEAD, 1862, 1861. Spithead Forts, COLES, 1861; SPITHEAD, 1862.

Suffolk (East). ADAIR (S.), Baron Waveney, 1860.

Sussex. Survey of the coast of, made in 1587. LOWER.

United States. Defence of Sea Coast. ABBOT (H. L.), 1888. Coast Defences, etc. UNITED States, 1883 and 1886, p. 348. Harbours. ABBOT (H. L.), 1881. Sea Coast. ABBOT (H. L.), 1888. Steel vessel of the "Destroyer" type designed for defending the harbours. UNITED STATES, 1886, p. 349.

Washington. BARNARD (J. G.), 1871.

See also FORTIFICATION.

DEFORMITIES, mechanical treatment of. Orthopraxy. BIGG (H. H.), 1865.

DELTAS. Delta in Miniature. READE, 1884.

Danube. Report on its delta. SPRATT (T. A. B.), 1858.

Ganges, recent changes in the Delta of the. FERGUSSON (J.), 1863.

Irrawaddy. LOGIN, 1857.

Nile Delta. Effect of wave influence on the deposits. SPRATT (T. A. B.), 1859.

See also BARS at river mouths.

DERELICTS.

Floating Derelicts. Report of Joint Committee of Admiralty and Board of Trade on the subject. PARLIAMENTARY..Papers, 1894. Add. 526.

United States Derelict Schooner, "W. L. White." With the tracks of three other notable derelicts, etc. UNITED States, 1889, p. 343.

DESERTS.

Chile. Desert of Atacama. Means of communication. LASTARRIA, 1880.

DESIGN.

Application of Plane Geometry to. REDERA, 1858.

Artist and Amateur's Magazine. PERIODICAL PUBLICATIONS, p. 12.

Industrial Design applied to Mechanics and to Architecture. ARMENGAUD, 1860. Draughtsman's book of Industrial Design. ARMENGAUD (J. E.), 1853.

Machines and Architecture. Shading and Colouring of Designs. ARMENGAUD (J. E.), 1849.

Registration of. Law and Practice. BILLING and Prince, 1845.

DESTRUCTORS.

Destructors and Refuse Furnaces: a Lecture, etc. WARNER (W.), 1888.

Disposal of refuse by cremation. SAUNDERS (W. S.), 1881.

Refuse Burning. LAWS (W. G.), 1891. Add. 514.

Refuse Destructors. JONES (C.), 1887, '94.

Leeds. Destructors and Carbonizer of house, ashpit, and market refuse. HEWSON (T.), 1884. Fryer's patent. Report of Leeds Sanitary Committee. FRYER, 1877.

Liverpool. Refuse Destructors. Report. LIVERPOOL, 1890. Add. 515.

See also REFUSE OF TOWNS, SANITATION.

DETONATORS.

Nobel's Explosive Company. Accident. REDDING, 1879.

Explosion of detonators. REDDING, 1890.

DEW. Essay on. WELLS (W. C.), 1815, 1818.

Dew ponds. SLADE, 1877.

DIAMONDS. ALLEN (W.) and Pepys, 1807; POLE, 1861.

Diamonds Fields. South Africa. DICKSON (W.) & Co.

Diamond Rock of South Africa. HUDLESTON (W. H.), 1885.

—— Diamond Mines. Africa (South), Diamond Mines of. REUNERT (T.), 1892, 1893.

—— Africa, South and East. INGRAM (J. F.), 1889.

—— Cudgegong. MACKAY (A.), 1870.

—— Kimberley and De Beers Diamond Mines. Report upon the Excavations at. WATSON (T. P.), 1883.

DOCKS (PARTICULAR)—*continued.*

Portsmouth. Prices for dwelling house for Port Admiral. PORTSMOUTH, 1800.

Quebec. PILKINGTON (W.), 1879–81.

—— Dry dock at mouth of the River St. Charles, Quebec. BAILLAIRGÉ, 1876.

Rotherhithe, Commercial Docks. Specifications. ROTHERHITHE, 1852–60.

—— Commercial Docks and Howland great Wet Dock. GOULD (N.), 1844.

—— Grand Collier Docks. Prospectus. GRAND Collier, 1837.

St. Helena. Practicability of making a depôt for repairing leaky vessels. LEES (J.), 1860.

St. John's, Newfoundland. Wooden graving dock. Report. KEATING, 1884.

St. Katherine's Docks Act, 1825; information useful to owners, masters, etc., using them, 1829; List of Proprietors, 1832; facts connected with them, 1824; Prospectus, 1825; Tables of rates and charges, 1832; and a refutation of misstatements made against them, 1825. ST. KATHERINE'S Docks.

Sheerness Dockyard. Plan. SHEERNESS, 1858, 1878.

Southampton. Collection of photographs. SOUTHAMPTON.

—— Port and docks of Southampton. LUIGGI, 1883.

—— Statement as to establishment of Docks within the Port. SOUTHAMPTON Dock Co., 1882.

Suez repairing dock. Notice on its construction. STŒCKLIN (A.), 1867.

Sunderland. Formation of wet docks. RENNIE (G.), 1832.

—— Specifications for the Excavation, Masonry, etc. SUNDERLAND Harbour, 1850.

—— Report on the formation of. WALKER (James), 1832, p. 393.

Surrey Commercial Docks. M'CONNOCHIE, 1893.

Swansea. PAGE (T.), 1846.

—— Objections to the plans of I. K. Brunel and T. Page. MURRAY (John), 1846.

Table Bay Docks and Breakwater. Management Committee, with Reports, revenue and expenditure, etc. TABLE Bay, 1877–79.

—— Table Bay, Port Elizabeth, the Kowie and East London. Return of Revenue and Expenditure. TABLE Bay, 1875.

Thames Dry Docks. JORDAN (C. H.), 1882.

Tilbury Dock. LUIGGI, 1886.

—— Tilbury Deep Water Docks. Opening, 1886. EAST and West India.

Tyne. Report on the plan of a dock on the low lights shore. URE (J. F.), 1870.

DICTIONARIES—*continued.*

Engineer's and Mechanic's Encyclopædia. HEBERT, 1835–36.
Engineering. DELAISTRE, 1812.
—— Engineering, with technical terms in French, German, Italian, and Spanish. BYRNE (O.), 1869–81.
—— Engineering. Technical vocabulary and dialogue. THOMASON Civil Engineering Coll., 1862–4.
English Cyclopædia. ENGLISH Cyclopædia, 1854–55; KNIGHT (C.), 1859–61.
French Administration. BLOCK, 1856.
French Furniture, Dictionary of. VIOLLET-LE-DUC (E. E.), 1868, '75.
Geology and Mineralogy. HUMBLE, 1843.
Gods, heroes, and fabulous persons of antiquity. BELL (J.), 1790.
Hazell's Annual Cyclopædia, 1886, etc. HAZELL.
Hydrographic Dictionary of France, nomenclature of rivers, canals, etc. MOITHEY, 1803.
Hygiene and Public Health. BLYTH (A. W.), 1876.
—— Public Hygiene Dictionary. TARDIEU (A.), 1852–54.
Law Dictionary. TOMLINS (Sir T. E.), 1838.
Lexicon technicum. HARRIS JOHN, 1708–10.
Manufactures, Mining Machinery, and the Industrial Arts. DODD, 1876.
Marine. FALCONER, 1815.
Mathematics, Applied. SONNET (H.), 1867.
Mathematical and Philosophical Dictionary. BARLOW (P.), 1814.
Mathematical Sciences, Pure and Applied. MONTFERRIER, 1835–40.
Mechanics, Practical, and Machines in German, French, English. FELLMER, 1866.
Micrographic Dictionary. GRIFFITH and Henfrey, 1883.
Military Encyclopædia. FARROW, 1885.
Science, Literature, and Art. BRANDE and Cox, 1865.
Technologische Encyclopädie. BERMOUTH, 1850; PRECHTL and Karmarsch, 1830–65.

DICTIONARIES OF LANGUAGES.

Anglo-Saxon and English. BOSWORTH, 1876.
Dakota-English Dictionary. RIGGS (S. R.), 1890.
Dano-Norwegian and English Languages. LARSEN, 1888.
Dutch and English. JAEGER (R.), 1865.
English Language. ANNANDALE (C.) 1886.
—— Etymological English Dictionary. CHAMBERS (W. and R.), 1884.
—— Encyclopædic Dictionary. HUNTER (R.), 1885–88.

DICTIONARIES OF LANGUAGES—*continued.*

English Language. English. JOHNSON (S.), 1803, 1827.
—— Pronouncing. KNOWLES (J.), 1837.
—— on Historical Principles. MURRAY (J. A. H.), 1884, etc.
—— English, Students' and Imperial. OGILVIE, 1865, '67, '90, '91.
—— Etymological. SKEAT (W. W.), 1882, 1891.
—— English Dictionary. WEBSTER (N.), 1862, '90.
—— Century Dictionary. WHITNEY (W. D.), 1889–91.
English. Thesaurus of English Words and Phrases. ROGET (P. M.), 1859.
French. ACADÉMIE Française, 1835; LITTRÉ, 1863–69, 1881; SMITH (L.) and Hamilton, 1860, 1869.
—— French and English. BOYER, etc., 1829; CLIFTON and Grimaux; FLEMING and Tibbins, 1841–44. International Dictionary. HAMILTON (H.) and Legros, 1865, '69.
—— Synonymes. ANONYMOUS, 1822, p. 44.
German and English. CAUVIN, 1870; FLÜGEL, 1856, 1891; SANDERS (D.), 1876, 1885; WHITNEY (W. D.), and Edgren, 1893; KUTTNER and Nicholson, 1805–13.
Greek-English Lexicon. LIDDELL and Scott, 1845; WRIGHT (M.), 1839.
Indian Tribes of British Columbia. Comparative Vocabularies of. TOLMIE (W. F.) and Dawson, 1884.
Italian and English. BARETTI, 1831; COMELATI and Davenport, 1873.
Latin-English Dictionary. SMITH (Sir William), 1855.
Portuguese and English. LACERDA, 1866–71; TRANSTAGANO (A. V.), 1773.
Russian and English Dictionary. ALEXANDROW (A.), 1879–1885; TAUCHNITZ (K.), 1888.
—— Dictionaries of the Russian, French, German and English Languages. REIFF (C. P.), 1871–2 and 1887–91.
Spanish, French and Italian. ANONYMOUS, 1571, p. 57.
—— Spanish and English. ANONYMOUS, 1809, p. 49. NEUMAN and Baretti, 1854.
—— Lengua Castellana. REAL Academia, 1803.
Swedish. English-Swedish. NILSSON, Widmark and Collin, 1875.

DICTIONARIES OF LANGUAGES (TECHNICAL).

Competition. FAVARO, 1876.
Vocabularies of technical terms, in eight Languages. HALL (Henry), 1865.
Dictionnaire Technologique, Anglais-Français et Français-Anglais. BURGUE, 1874.

DICTIONARIES OF LANGUAGES (TECHNICAL)—*continued.*

English-French technical Dictionary. VIVANT (E.), 1884.

English, French, German, Italian, Spanish.
WERSHOVEN (T. J.), 1885.

Technical Dictionaries in French, German, and English.
RUMPF (C.) and Mothes, 1868–72.

Technological Dictionary in French, German, and English.
TOLHAUSEN and Gardissal, 1854–5;
TOLHAUSEN (A.), 1873–6.

English, French, Italian, German. Technical Pocket Dictionary.
OFFINGER, 1889–90.

French-German Technical Vocabulary. WERSHOVEN (F. J.), 1878.

English, German, French. RÖHRIG (E.), 1887–91.

English and German Technological Dictionary. EGER, 1882–4.

English and German Technical Dictionary.
SCHLÖSSING (F. H.), 1865.

English and German Technical Vocabulary.
WERSHOVEN (F. J.), 1885.

German Technical Dictionary.
KARMARSCH and Heeren, 1854, '74.

Spanish-English. Technological. PONCE de Leon, 1886–93.

Architecture. Glossary of Terms. ANONYMOUS, 1850, p. 46.

Charts and Maps. Glossary of French Terms adopted on French Charts and Maps and in Sailing directions.
CARRINGTON (R. C.), 1879.

Engineering Terms. German-English and English-German.
ANONYMOUS, 1869, p. 44.

—— Italian, French, English, etc., for Engineer and Architect.
CRUGNOLA, 1884.

Engines, etc. TABERNA, 1874.

Furnace Terms in English, French, and German.
EGLESTON, 1888.

Geography and Astronomy, Definitions of Terms used in.
HODGKIN (J.), 1812. App. 562.

Iron Structures. Vocabulary of Technical Terms used in the Design, Manufacture, and Commerce of.
MATHESON (E.), 1873.

Irrigation and Hydraulic Works. Vocabulary of terms peculiar to French and Italian. BUFFON (N. de), 1869. Add. 489.

Law. Judicial Dictionary of Words and Phrases.
STROUD (F.), 1890.

Locomotives. Italian, French, German and English.
FADDA (S.), Olivetti and Silvota, 1891.

DICTIONARIES OF LANGUAGES (TECHNICAL)—*continued.*

Marine. German, Italian, French, and English. DABOVICH, 1883.

Marine Dictionary in English, French, and German. PAASCH, 1885.

Mechanical Engineering. Terms used in the practice of, LOCKWOOD (C.), 1888.

Military and Naval. (Polyglot). ANONYMOUS, 1881, p. 44.

—— Technical Dictionary of the French Language. BURN (R.), 1860. Polyglot Dictionary of Technical, Military, and Naval Terms. LANDOLT, 1865–68.

Mining. English and Foreign Mining Glossary. ANONYMOUS, 1871, p. 45.

—— English-German Dictionary of Mining, etc., terms. RÖHRIG (E.), 1881.

—— Glossary of Scotch Mining Terms. BARROWMAN, 1886.

Nautical. Vocabolar of Italian sea-phrases. FINCATI, 1877.

—— Vocabulary of French sea-phrases. FALCONER, 1815.

—— Dutch, French and English. ROEST (C.), 1842.

—— Vocabulary of Sea Words in English, French, German, Spanish, and Italian. LITTLETON, 1879.

Railways. Italian, French, German and English. FADDA (Olivetti and Silvota, 1891.

Steam marine. Vocabulary of terms in the German, Danish, Spanish, Dutch, Italian, Russian, Swedish, and French. PARIS (F. E.), 1861.

DIGGING.

Art of Mechanical Digging. PROCTOR (F.), 1882.

Digging and Cultivation of Soil. Specifications of Patents. COMMISSIONERS, p. 283.

DILAPIDATIONS.

Nature, etc. MORRIS (T.), 1863.

Report of the Select Committee on Dilapidations. ROYAL Inst. of British Architects, 1844.

DISCOVERY. Philosophy of discovery. WHEWELL (W.), 1860.

DISEASES.

Aneurism. Correspondence with Richard Owen on John Hunter and Aneurism. JESSE, 1882.

Diphtheria, Prevention of. BALCH, 1889.

Fever, outbreak of, at Balranald, caused by polluted water. BALRANALD, 1889.

Heart Disease, Dropsy, Cancer, Phthisis. Geographical distribution in England and Wales. HAVILAND (A.), 1875.

Heat cure. Treatment of Diseases by heated air. WILSON (Erasmus), 1860.

See also EPIDEMICS, INFECTIOUS Diseases.

DISINFECTION.

Disinfectants and Disinfection. SMITH (Robert A.), 1869; VALLIN (E.), 1882.

Investigations on the power of "Amines" Disinfectant on pathogenic micro-organisms. KLEIN (E.), 1889, '90

Railway Sanitation. Methods used and results obtained in making germicidal-efficiency tests of a disinfectant. SEDGWICK (W. T.), 1893. Add. 533.

DISTILLATION. Fermentation and Distillation. HARTLEY (W. N.), 1884.

Patent West India Still, plan and description. SAINTMARC (J. J.), 1829, p. 156.

DISTILLING APPARATUS. Distilling Apparatus for Ships. THURSTON (R. H.), 1870, p. 308.

DITCHES, use and construction of. BOWIE (A. J.), 1885.

DIVING AND DIVING DRESSES.

Appliances for Working under Water or in Irrespirable Gases. GORMAN, 1882.

Divers' Manual. SIEBE, Gorman & Co., 1881, 1885.

Diving and Diving Machines. SMITH (S. W.), 1820.

Diving apparatus: with instructions for submarine operations. SIEBE, Gorman & Co.

Diving Dresses. QUINTON, 1840. Description of improved, BETHELL, 1838.

History of Diving from the earliest times. HEINKE, 1870.

Method of supplying the diver with air under water. HOUGH, 1813.

DIVING BELL (NAUTILUS). Circular Exhibit. ANONYMOUS, 1858, p. 42.

DIVINING ROD. *See* WATER (General References).

DOCKS (GENERAL REFERENCES).

Docks and Dockisation. SALWEY (E. R.), 1893.

Docks and Dock Construction, notes on. COLSON (C.), 1894. Add. 493.

Dock Walls, design and construction. ALLEN J. R., 1876.

Floating Docks, calculation of. FORCHHEIMER, 1892.

Hydraulic Pontoon-dock. NYSTROM, 1859.

Janicki's patent floating dock. SIMON (H.), 1872.

Patent Dock Gates. PEACOCK (R. A.), 1882.

Patent floating pontoons or docks. RENNIE (G. B.), 1860.

Patent Slip Docks. BELL (R. B.), 1869.

DOCKS (GENERAL REFERENCES)—*continued.*

Physical features, history, construction, etc. VERNON-HARCOURT (L. F.), 1885.

Self Propelling, Self Careening Floating Docks. RENNIE (G. B.), 1884.

Ship Caissons for dock basins and dry docks. ANDREWS (J. J. F.), 1891.

Simpson's Improved Dry Docks. SIMPSON, 1884.

Specifications of Floating Docks. CAMPBELL (J.), 1869.

Transport, a review of Docks, etc. PERIODICAL PUBLICATIONS, p. 25.

Windmill Croft Dock, Report on. URE (J. F.), 1855.

DOCKS (PARTICULAR).

Aberdeen Graving Dock. Report as to cause of damage, Nov. 24, 1887. MESSENT.

Alexandra (Newport and South Wales) Docks and Railway. Report on Classification of Merchandise Traffic, 1891. NEWPORT, Mon.

Alloa (South), proposed wet dock. LESLIE (J. & A.), 1872.

American System of Dry Docks. LITTLE, 1882.

Antwerp Docks. ROGERS (G. A.), 1893.

Avonmouth and Portishead Docks. Report on the proposed scheme for their construction. STEVENSON (D.) & Ball, 1872.

Barcelona. Proposed Floating Dock. HALPIN (D.), 1878.

Barry Dock. Description. ROBINSON (John), Architect, 1888.

Barry Docks and Railway. Classification of Merchandise Traffic. BARRY Docks, 1891.

Bermuda, Voyage of the floating dock "Bermuda" from England to. BERMUDA, 1869.

Birkenhead. WEBSTER (Thomas) Q.C., 1848. Letter to Shareholders in the Dock Company. LAIRD, 1851. Letters. RENDEL (J. M.), 1848, 1850, 1851. Reports. ABERNETHY (J.), 1850; STEPHENSON (R.), & Beaufort, 1851.

Bombay. JOHNSON (S. A.), 1874.

—— Construction of a wet dock in Moody Bay. AITKEN (R.), 1867.

—— Prince's Dock 1871–74; foundation stone, 1875; extension, 1888. INDIA, p. 111.

—— Wet and Dry Docks, 1856, 1867. INDIA, p. 112.

Bordeaux. Construction and Working of the Dock of the fort of Bordeaux. FRANCHIMONT, 1893.

Bridgewater. PRICE (H. H.), 1835.

Brisbane, Report on the proposed dry dock. BRISBANE, 1875.

Bristol Dock Bill, 1863. Report on. BRISTOL. Add. 487.

DOCKS (PARTICULAR)—*continued.*

Bristol. Differences between the Bristol Dock Company and the inhabitants of Bristol. BRISTOL, 1807.

—— Contract for a two-floor shed. AVONMOUTH, 1886.

—— Dockising the River Avon. BRISTOL, 1881.

—— Report. HOWARD (T.), 1859.

—— Report on increased dock accommodation in the port of. HAWKSHAW (Sir J.), 1860. Add. 506.

British Columbia. Esquimalt Graving Dock Works. BENNETT (W.), 1889; ESQUIMALT, 1888.

Calcutta. Construction of Docks, 1885, '87. INDIA, p. 114.

—— Floating Docks, necessity of forming wet docks. HENDERSON & Greaves, 1854.

Carthagena. Iron floating dock. RENNIE (G. B.), 1869.

Diamond Harbour on the River Hooghly. BOILEAU (J. T.), 1839.

Dublin. Wrought Iron Dock Gates of Graving Docks. GRIFFITH (J. P.), 1880.

East and West India Dock Company. Blackwall Docks Act, 1803. EAST and West India.

East India Dock Amending Act, 1803. EAST and West India.

East and West India Docks Extension Bill, 1882. EAST and West India.

—— Kirk and Randall *v.* East and West India Dock Company. KIRK and Randall, 1885-86.

—— Projected railways to the East and West India Docks. COMMERCIAL Docks, 1835.

European Dock-yards. HICHBORN, 1886.

France, Dockyards of. FRANCE, 1841. Add. 501.

Frankfort-on-Main. Construction of settling reservoir for the lock water. LINDLEY (W. H.), 1884.

Glasgow. Report on graving docks for the port of. URE (J. F.), 1854.

Great Britain and Ireland. The Dock and Port Charges. THUBRON (R.), 1877, '81, '88.

Greenhithe and Northfleet. PLEWS, 1866.

Greenock. Report regarding the proposed Wet Docks at. WALKER (James) and Burges, 1836.

Great Grimsby. New docks, 1852. GREAT Grimsby.

Halifax, N. S. Proposed dry dock. KEATING, 1883.

Hartlepool (West). Report. HARTLEPOOL, 1850. Add. 505.

Havre Port. New metal gates to the transatlantic docks. WIDMER (E.) and Desprez, 1887.

—— Notes on the construction of the walls of the quay of the wet docks. WIDMER (E.), 1885.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Ireland. Ballybay River near Athlone. Report on proposed drainage of flooded lands, 1846. LONG (J.).

—— Clongill District, Co. Meath. PACKER & Benn, 1847.

—— Cork. Argideen District. KING (M.), 1847.

—— —— Ballinhassig District. KING (M.), 1849.

—— —— Castlemartyr District. KING (M.), 1847.

—— —— Ratooragh District. KING (M.), 1846–49.

—— Deel, District of the. BRASSINGTON, 1846.

—— Devon Estate drainage, Ehernagh district, co. Limerick. BRINSDEN & Harding, 1846.

—— Doohulla District. NICHOLSON (S.), 1846.

—— Hind River, co. Roscommon. Report on Drainage of lands, 1846. LONG (J.).

—— Ker Estate District, county Down. Report on the Drainage and improvement of the lands in. TANNIHILL (W.) & Fraser, 1847.

—— Kilbride District, Counties of Kilkenny and Tipperary. MATIER, 1846.

—— Kildare and Westmeath. Reports of districts chiefly in. GRAY (R. A.), 1846–50.

—— Leslie (Meath) Estate District. Baronies of Upper Navan, Lower Moyfenrath, and Ratoath. Report on their Drainage and Improvement. SULLIVAN (T.), 1847.

—— Lough Alick district, County of Mayo. Report. BRETT (H.), 1846.

—— Lough Corrib District. Valuation and improvement of the lands. HARDING (R.), 1846.

—— Lough Erne Drainage Scheme. Return for Report of Commissioners of Public Works, Ireland, with reference to. ERNE (Lough), 1891. Add. 499.

—— Lough Neagh District. Drainage and Navigation. MANNING (R.), 1884.

—— —— Flooded lands and improvement of the Navigation in the Loughs Neagh, Corrib Marsh, and Carra Districts. MACMAHON, 1845–46.

—— Meath, County of. MULVANY (C.), 1847.

—— Mullyfarry, Lake District, County of Mayo. BRETT (H.), 1846.

—— Shanagolden (Districts of) Limerick. NICHOLSON (S.), 1846.

—— Shanbogh District, County of Kilkenny. Report. LINEHAN, 1847.

—— Skane, River, District, County of Meath. NEVILLE (P.), 1847.

—— Waste Lands. Letter on the propriety of reclaiming them. SMYTH (G. L.), 1838.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Italy. CUPPARI, 1893.

—— (South), Marshes of. Land speculation and cotton growing. DENTON (J. B.), 1865.

Kent (West) Drainage Bill. Minutes of evidence, 1875. KENT.

Keyingham Level in Holderness drainage and navigation. CHAPMAN (W.), 1797, p. 242.

—— Drainage and improvement of Keyingham Level and the adjoining country. CREASSY, 1801.

—— Keyingham Level. GOLBORNE, 1779, 1800. Mr. Golborne's plan of draining. CHAPMAN (W.), 1800, p. 242.

Keythorpe System of Land Drainage—its principles, efficiency, economy, and opponents. TRIMMER (J.), 1855.

Lewes Laughton Level. Report concerning its drainage. SMEATON (J.), 1768, p. 208.

Lincoln and Boston, Drainage of Water between. GRUNDY, 1753.

Lincolnshire. Act for embanking and draining certain Salt Marshes and Low Lands, 1793, 1812, LINCOLN (County of).

—— Act for reclaiming from the Sea certain Lands abutting on the Coast of Lincolnshire, 1851. LINCOLN (County of).

—— (South) Fens of. History. WHEELER (W. H.), 1868.

Malden and Sheen. Bill for the more effectual Drainage of certain Lands in the Valley of. MALDEN, 1859.

Massachusetts. Mystic, Blackstone and Charles Rivers Valleys. Report of Commission on General System of Drainage. MASSACHUSETTS, 1886. Add. 519.

Muston Drainage Bill. Compensation for lands. MUSTON, 1800.

Nene. Amending the outfall of the, securing the Middle and North Levels of the Fens from inundation. EDWARDS (L.), 1771.

—— Nene Valley. RENDEL (J. M.), 1849.

—— Nene Valley Drainage and Navigation Reports. FOWLER (Sir John), 1858. Add. 501.

—— Improvement. OLVER, 1875.

Netherlands. Drainage Machinery of. HUET (A.), 1893. Add. 508.

Norfolk. Draining of marsh land in the County of. BATESON, 1710.

Nottingham. Low lands in the County of. Acts and amended Acts, 1796, 1801, '13. NOTTINGHAM.

Oxford. Valleys of the Thames and Cherwell, near. PHILLIPS (J.), 1874.

Potomac flats at Washington. Reclamation of. HAINS (P. C.), 1894. Add. 505.

Regent's Park Drainage, 1848. MITCHELL (D. W.).

Romney Marsh. Expense of Dymchurch Wall, 1764–1809. ROMNEY Marsh, 1810–37.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Romney Marsh. Laws and Customs of Rumney Marsh. ROMNEY Marsh, 1726, 1840.

—— Expenses of the wall from 1810 to 1837, inclusive. HALLOWES (J.), 1837.

Taillau, Domaine du. BRYAS, 1855.

Thames (Lower) Valley Drainage. BUCHANAN (Dr. G.), 1878.

Thames Valley Drainage Works Proposed. Effect on the Hincksey Lake. PRESTWICH, 1884.

—— Manor of Imber, otherwise Imworther, 1607. DENHAM (J.), &c.

—— Thames Valley Drainage Acts, 1871 and 1874. FALKINER and Tancred, 1876.

—— Report on Drainage of Lands. HAWKSHAW, 1878.

Trent. GIBBS (L.), 1888.

Witham (River). Steam power applied to the Drainage of the fourth district. WELSH (E.), 1865.

Yorkshire. Various parishes of East Riding. HODGMAN, 1796.

Zeeland, regulations. CALAND (A.), 1857.

Zuider Zee reclamation. HUET (A.), 1890; BÜSING, 1894. Add. 489; KIELMANN, 1857; KREUTER, 1854, '87; SCHOUTE (P. H.), 1893.

See also BOGS.

DRAINAGE OF TOWNS (GENERAL REFERENCES).

HENROT, 1891; RAWLINSON (Sir R.), 1854.

Application of the Siphon. COWEN, 1853.

Bad Drains and how to test them. REEVES (R. H.), 1885.

Drains and Drainage Notes. SLACKE (W. R.), 1875.

Drainage for profit and for health. WARING (G. E.), 1879.

Evacuation of night-soil. Report on. TRÉLAT (E.), 1882.

Fowler's self-acting Water closet. FOWLER, 1874.

House drainage. OUGH, 1879; and Water Service. BAYLES, 1882; CHADWICK (Sir E.), 1884, p. 134; GRAY (J.), 1855; MIDDLETON (R. E.), 1881; PUTNAM (J. P.), 1886. Guildford. PILBROW, 1867.

—— Architects and House Drainage. WARING (G. E.), jun., 1886.

—— Architect's Letter on House drainage. MASTERS, 1876.

—— By-Laws and Regulations. FIELD (R.), 1877, '78.

—— Drainage and Ventilation of Houses. FIELD (R.), 1882.

—— Drainage and sanitary appliances of residences. COLYER, 1889.

—— Drainage of habitable buildings. BEARDMORE (W. L.), 1892.

DRAINAGE OF TOWNS (GENERAL REFERENCES)—*continued.*

House Drainage. Drainage of town houses.
LAWFORD (G. M.), 1892.

—— How to drain a house. READE, 1877; WARING (G. E.), 1885.

—— Information respecting House Drainage.
ATKINSON (J.), 1894.

—— Private Connections, House Drains, etc. McKIE, 1881.

—— Sanitary Drainage of Houses and Towns.
WARING (G. E.), 1878.

—— Sanitary Regulations and rules for house drainage.
CUTHBERT, 1884.

See also SANITATION.

Hydrosthetics of the Cistern, Drain and Sewer.
MORRIS (T.), 1878.

Information as to ventilating and flushing sewers.
BUCKHAM, 1884.

Law of Drainage and Sewers. KENNEDY and Sandars, 1884.

Lincoln's (Lord) Sewerage, Drainage, etc., of Towns Bill, 1846.
HEALTH.

Martin's improvements in apparatus and means used for draining towns, cities, etc. MARTIN (John), 1850.

Native Guano *versus* Sewage Water. ANONYMOUS, 1849, p. 49.

Pneumatic Drainage, Berlier System. SMITH (Adolphe), 1883.

Principles. LEE (W.), 1854.

Reform of the Sewers, or, manure wasted and land starved.
CLARKE (G. R.), 1860.

Rudimentary Treatise. DEMPSEY, 1867, 1887.

Scheme for effectual Drainage. ANONYMOUS, 1855, p. 55.

Separate system. MONSON, 1875.

Sewerage of Towns. DENTON (J. B.), 1855.

Sewerage, Irrigation. LATHAM (B.), 1867–71.

Sewerage and Land-Drainage. WARING (G. E.), 1889.

Sewerage works in Urban Districts. VAWSER (R.), 1886.

Subsoil drainage, foundations, etc. SLACKE (W. R.), 1875, 1878.

Systems of evacuation of water and filth.
OVERBECK de Meijen, 1883.

Town Sewage Question. CHILD, 1865.

Vitrified *versus* porous Drain Pipes. ANONYMOUS, 1856, p. 58.

Wharncliffe's (Lord) letter on Draining. Reply to.
DAVIS (H.), 1851.

DRAINAGE OF TOWNS (SPECIAL).

Adelaide. ADELAIDE, 1878; CLARK (W.), 1878.

Aldershot. Report. ALDERSHOT, 1870.

Alnwick. BALFOUR (D.), 1892.

Atlanta, Georgia. Sewerage. HERING (R.), 1891.

DOCKYARDS (PARTICULAR)— *continued.*

United Kingdom. Accounts showing cost of articles manufactured in workshops and steam factories, 1862–68.
PARLIAMENTARY..Papers, p. 475.

—— Report of Committee on Dockyard Economy, 1859–60.
PARLIAMENTARY..Papers, p. 474.

—— Report of Commissioners to inquire into control and management of H.M.'s Naval Yards, 1861.
PARLIAMENTARY..Papers, p. 474.

—— Report of Select Committee on Dockyards, 1864.
PARLIAMENTARY..Papers, p. 474.

—— Labour Charts, 1864–65. PARLIAMENTARY..Papers, p. 474.

—— Value of Land Buildings, etc., 1866–67.
PARLIAMENTARY..Papers, p. 474.

—— Admiralty and Dockyard Administration and Expenditure. Reports of Committees, 1886–87.
PARLIAMENTARY..Papers, p. 475.

—— Annual Accounts of Shipbuilding and other Dockyard Transactions, 1866, etc. PARLIAMENTARY..Papers, p. 475.

Washington Navy Yard, Channel Improvement. MENOCAL, 1882.

Woolwich Dockyard. Plan. WOOLWICH, 1858.

—— New Mast Pond. Proposals of Prices for Works.
WOOLWICH, 1800.

DOMES.

Dimensions of ironwork in the cupola of the Halle aux Grains.
BRUNET, 809.

Ironwork for the Dome of the proposed Government Building, Chicago Exhibition. McGUIRE, 1892.

Stability of Domes. TARN (E. W.), 1866.

DOMESTIC ECONOMY.

Derbyshire General Infirmary. Philosophy of Domestic Economy exemplified in. SYLVESTER (C.), 1819.

DOORS.

McNeil's patent steel-embossed Man- and Mud-Hole Doors. Report. TRAILL (T. W.), and Samson, 1888.

DOOR FASTENINGS, History of Ancient. HIGGIN, 1850.

DRAINS, CULVERTS. Average plans. HART (J. H. E.), 1868.

DRAINAGE OF LAND (GENERAL REFERENCES).
LECLERC, 1853; MECHI, 1847.

Acts for the advance of private money for the Drainage of Land. 1849, '50, 56. PARLIAMENTARY..Papers, p. 475.

—— Land Drainage Act, 1861. DENTON (J. B.); THRING (T.), Provisions, working, and results. GRANTHAM (R. B.), 1865. Act to amend the Law, 1861.
PARLIAMENTARY..Papers, p. 475.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Cannes. Sewerage on the Shone System. Report. SHONE (I.), 1885.

—— Works of Sewerage and Drainage, proposed. GALTON, 1883.

Canterbury. PILBROW, 1867.

Castleford and Whitwood Main Drainage, 1875. PATERSON and Wheater.

Chelsea, U.S. Drainage Construction Company *v.* City of Chelsea, U.S. Pleadings and Evidence. DRAINAGE, 1889

Chicago. CHICAGO, 1887

Christchurch. CLARK (W.), 1878.

Cleveland. System of main sewerage. HERING (R.), 1882.

Columbia, District of. Sewerage. HERING (R.), etc., 1890.

Columbus, Ohio. Sewerage of. WARING (G. E.), 1890.

Concepción. CONCEPCION, 1892.

Croydon. ARNOTT and Page, 1853.

—— Epidemic, 1853. CROYDON.

—— Proposition to discharge portion of the Sewage into a sewer under the jurisdiction of the Metropolitan Board of Works. CROYDON, 1862.

—— Reports on the Sewerage. CROYDON, 1853.

Danzig. DANZIG, 1881; WIEBE (E.), 1865.

Delhi. Report. GREATHED, 1852; INDIA, 1852, p. 118.

Dorking. System of Sewerage. DORKING, 1893.

Dortmund, drainage of. MICHAELIS and Gordon, 1878; MITTERMAIER, 1878.

Driffield. Report, 1874. OLDHAM and Bohn.

—— Specification of Works in earthwork, concrete, brickwork, ironwork, and iron and earthenwork pipes, 1878. OLDHAM and Bohn.

Dublin Sewage. Applying Hydraulics to design for Sewage works, etc. SMITH (John A.), 1885.

—— Main Drainage Outfalls. GRIFFITH (J. P.), 1885.

—— Report of Royal Commissioners. DUBLIN, 1880.

Dudley. MARTEN (H. J.) and Stileman, 1876.

Dunedin. Sanitary Commission on Sewerage and Drainage. DUNEDIN, 1865.

Elberfeld. LINDLEY (W. H.), 1882, '93.

England, Sewage-works of some towns in, Report. ROWE (R. R.), 1869.

Eton College and Eton. ROE (J.), 1842.

Europe. PORTUGAL, 1880.

Florence. TURIN, 1886.

France. Instructions. FRANCE, 1865, p. 436.

Frankfort-on-Main. LINDLEY (W. H.), 1886.

DRAINAGE OF LAND (GENERAL REFERENCES)—*continued.*

Reclamation of Slob Lands. BELFAST, 1876.

Reclamation of Tide-lands and relation to Navigation. MITCHELL (H.), 1871.

Report of Select Committee on the enabling of possessors of entailed estates to charge cost of draining, 1845. PARLIAMENTARY..Papers, p. 475.

Resources of Reclaimable Land. SANDERSON (J.), 1860.

Rudimentary Treatise. DEMPSEY, 1859, 1887.

Suggestions for the general employment of water-mills with inclined scoop wheels. ECKHARDT (A. G.) and Douwes, 1808.

—— —— Straight *versus* inclined scoop wheels. ECKHARDT, 1816.

System practised by Mr. J. Elkington. JOHNSTONE (J.), 1797, 1841.

Thorough drainage and deep Ploughing. SMITH (James) of Deanston, 1844.

Treatise. HUTCHINSON (H.), 1844.

Water Meadows, their utility, form and management, and the drainage and irrigating of Peat Bogs, etc. SMITH (William), Engineer, 1806.

DRAINAGE OF LAND (SPECIAL).

Ancholme Lincolnshire Level. RENNIE (Sir J.), 1845, p. 102.

Ancroft Fen, Marshes from, to Wainfleet Haven, drainage. CHAPMAN (W.), 1810, p. 242.

Arun Level. MACNEILL, 1837.

Australia (South). Drainage works in the South East District. Report and Correspondence. SOUTH Australia, 1872–1875, p. 227.

—— Port Macdonnell Swamps. PORT MACDONNELL, 1878.

BEDFORD LEVEL.

—— ANONYMOUS, 1726, p. 53; BADESLADE, 1729; BEDFORD Level; DODSON, 1665; ELSTOBB, 1793; LABELYE, 1745; POWNALL (T.), 1775.

—— Collection of Acts. BEDFORD Level, 1685–1762.

—— Deepening the rivers. ARCHER (T.), 1829.

—— History with the laws, etc., of the Bedford Level Corporation. WELLS (S.), 1830.

—— History of the great level of the Fens. MOORE (Sir Jonas), 1685.

Bedford Level. Laws of the Bedford Level Corporation. COLE (C. U.), 1803. Lot Book. WELLS (S.), 1841.

—— Petition to the House of Commons. BEDFORD Level, 1777.

—— Principles of the Bill. BEDFORD Level, 1777, 1778.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Bedford Level. Report on 100-foot Wash, and proposed Wash Bank. RENNIE (John), 1812.

Bedford Level—*Middle Level.* A letter on the Drainage of the Middle Level. RENNIE (Sir J.), 1842.

—— Report on the drainage of the Middle Level. WALKER (James), 1842, p. 394.

—— Substance of Report on the Drainage of the Middle Level. WALKER (James), and Burges, 1848, p. 395.

—— Walker and Burges's Reports on the Middle Level Drainage. BEDFORD Level, 1848, p. 114.

Bedford Level—*North Level.* Considerations on Mr. Rennie's plan for the drainage of South Holland. WING (J.), 1820.

—— Historical account. BEDFORD Level, 1809.

—— Outfall of the Wisbeach river. GOLBORNE, 1769.

—— Report on drainage of North Level and the outfall of the Wisbeach river. YEOMAN (T.), 1769.

Bedford Level—*South Level.* Letter to the Proprietors of Land in that part of it called the South Level on the expediency of the Middle Level Bill and a second letter. THOROLD (W.), 1861.

—— Observations on the frequent drowned condition of the South Level of the Fens. LEAFORD, 1740.

—— Present State of the South Level. PAGE (Sir T. H.), 1794.

—— Schemes for draining the South Level. PAGE (Sir T. H.), 1775.

—— South Level part of the Great Level of the Fens. COLE (C. N.), 1784.

Bedford Level—*South and Middle.* Draining of the south and middle levels. SMITH (Humphrey), 1729.

—— Humphrey Smith's Scheme for the Draining of the south and middle levels of the Fens. KINDERLEY, 1730.

—— Improvement of the Drainage of the South and Middle Levels. RENNIE (J.), 1810.

—— Proposed Improvements in the Drainage of Middle and South Levels. WELLS (S.), 1842.

—— South and Middle Levels of the Fens. Reports. PAGE (Sir T. H.), 1794.

—— Report for the better drainage of the south and middle level of the Fens and other lands on both sides of the River Ouse. WATTÉ (J.), 1791.

Bedford Level. Denver dam and sluices, pernicious consequences of replacing. ELSTOBB, 1745.

—— Eau Brink Cut. BEDFORD Level, 1823.

—— Eau Brink New River or Cut Deed Poll. HUDDART, 1804.

—— Eau Brink Drainage Company dispute relating to Cut and Works below Lynn, 1852, 53. NORFOLK Estuary.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Bedford Level. Drainage through the New River or Cut from Eau Brink to King's Lynn. EAU BRINK, 1825.

—— Joint Report of the Engineers appointed in consequence of the late intended Eau Brink Act. WALKER (James), and Mylne, 1825.

—— Eau Brink Drainage Bill, Minutes of Evidence. PAGE (Sir T. H.), 1794.

—— Bedford Level Corporation and Eau Brink Commissioners, Report on the Norfolk Estuary Scheme. GORDON (L. D. B.), 1849.

—— Lynn, port of. BRIDGEMAN, 1724.

—— Moreton's Leam-wash, Drainage of, and Whittlesea Mere and a portion of the Bedford Level. RENNIE (Sir J.), 1840.

—— Ouse. WOOD (Rev. P. S.), 1825.

—— Letter on the Works in the New Bedford, or one hundred feet River, the River Ouse, etc. WELLS (S.), 1828.

—— Sutton and Mepall Levels. Book of Reference to the Map of. ELSTOBB, 1750.

—— Vermuyden's Drain. RENNIE (Sir J.), 1840.

—— Wisbech Outfall, Report as to the, and the Drainage of the North Level and South Holland. RENNIE (J.), 1814.

Berbice, Alary and West Coasts Districts. Drainage of. BRITISH Guiana, 1879.

Beverley and Barmston Drainage. CHAPMAN (W.), 1806, p. 242; 1801, 1803, 1804, 1809, p. 243.

—— Report to Commissioners. JESSOP, Rennie & Chapman, 1804.

Black Sluice, Drainage and Navigation of, 1799–1846. BLACK SLUICE.

Carr Dyke Scheme. Report. WILLIAMS (John E.), 1880.

Dagenham Breach frauds and abuses. DAGENHAM Breach, 1717.

Derwent and Hertford, low grounds in the vales of. CHAPMAN (W.), 1800, p. 242.

Driffield Navigation. JESSOP, 1797.

Essex Act for reclaiming Lands on the E. and S.E. Coast, 1852. ESSEX.

Essex Estuary Land Reclamation. ESSEX, 1851.

Fenland. GIBBS (L.), 1888.

—— Ancient Reclamations in the English Fenlands. GROVER (J. W.), 1878.

—— Drainage of Fenlands Act, 1794. WELLAND River, 1794.

Fens, method of making the Banks almost impregnable. HARRISON (J.), 1770.

—— Proposals for draining the fens. ARMSTRONG (Col. J.), 1724.

—— Fens and Inundations of Marshland. LATHAM (R.), 1863.

DRAINAGE OF LAND (SPECIAL)—*continued.*

France. Drainage of Lakes and Marshes in France before 1789. DIENNE, 1891.

—— Studies on the drainage of France, meteorology and geology. VILLENEUVE (H. de), 1854. Add. 538.

Grand Sluice, Draining by the. HAWKSHAW, 1862.

Great Britain, general and uniform system of drainage. DENTON (J. B.), 1842.

—— Under Drainage of Land in Great Britain. DENTON (J. B.), 1856.

Hamburg. Sluice System. LINDLEY (W.), 1843.

Holland. HOLLAND, p. 65.

—— Account of the steam-engines for draining the polders of Wamel, Dreumel and Alphen.

Advantages of drainage into the North Sea at Schevengen. CONRAD (F. W.), 1847.

Hull. Low lands lying below the Wolds at the west side of the river, and in Frodingham, Carrs. CHAPMAN (W.), 1796, p. 243.

—— Low grounds lying on the Wolds on the west side of the river Frodingham, Carrs, Liffet, etc. JESSOP, 1796.

Humber, defence of Cherry Cobb Sands against the, drainage of Keyingham marshes and improvement of the foreshore opposite Foul Holme Sands. CHAPMAN (W.), 1801, p. 243.

India. Nujjufgurh Jheel, 1838, '55. INDIA, p. 126.

—— Reh Swamp and Drainage of the Western Jumna Canal Districts. OLIVER (E. E.), 1881.

Ireland. Drainage of Land. BEVAN (J.), 1846–47. FARMER & FRASER, 1847; FITZGERALD (M.), 1846–47; FORSYTH, 1846–51; FRASER (J.), 1847, FRASER (W.), 1844–51. Reports, 1831, '43–51. IRELAND, p. 140. Various districts. BARRY (F.), 1847–52; DEVERELL, 1847–50; KELLY (J. W.), 1843–51; KLASEN, 1847–51; MACMAHON, 1843–47; MANNING (R), 1847; MULVANY (T. J.), 1846–51; MURPHY (E.), 1846–47; OTTLEY, 1846–49; RANKIN (W. H.), 1846–51; ROBERTS (S. U.), 1843–52; RUSSELL (E.), 1843–45.

—— Arterial or River Drainage in Ireland. LYNAM, 1860.

—— Drainage and Improvement of Lands. Reports. FARRELL (J. B.), 1844–49; FARRELL (M.), 1846–50.

—— Ballinamore and Ballyconnell district. Valuation of the lands proposed to be drained in the. BRASSINGTON, 1845; Drainage of flooded lands. MACMAHON, 1845.

—— Ballinamona District Co. Tipperary. Report on the Drainage and Improvement of the Lands in the above District. THOMSON (James), 1846.

—— Ballinderry Lake District. Preliminary Report on the drainage and Improvement of Lands, 1846. LONG (J.).

DRAINAGE OF LAND (SPECIAL)—*continued.*

Ireland. Ballybay River near Athlone. Report on proposed drainage of flooded lands, 1846. LONG (J..

—— Clongill District, Co. Meath. PACKER & Benn, 1847.

—— Cork. Argideen District. KING (M.), 1847.

—— —— Ballinhassig District. KING (M.), 1849.

—— —— Castlemartyr District. KING (M.), 1847.

—— —— Ratooragh District. KING (M.), 1846–49.

—— Deel, District of the. BRASSINGTON, 1846.

—— Devon Estate drainage, Ehernagh district, co. Limerick. BRINSDEN & Harding, 1846.

—— Doohulla District. NICHOLSON (S.), 1846.

—— Hind River, co. Roscommon. Report on Drainage of lands, 1846. LONG (J.).

—— Ker Estate District, county Down. Report on the Drainage and improvement of the lands in. TANNIHILL (W.) & Fraser, 1847.

—— Kilbride District, Counties of Kilkenny and Tipperary. MATIER, 1846.

—— Kildare and Westmeath. Reports of districts chiefly in. GRAY (R. A.), 1846–50.

—— Leslie (Meath) Estate District. Baronies of Upper Navan, Lower Moyfenrath, and Ratoath. Report on their Drainage and Improvement. SULLIVAN (T.), 1847.

—— Lough Alick district, County of Mayo. Report. BRETT (H.), 1846.

—— Lough Corrib District. Valuation and improvement of the lands. HARDING (R.), 1846.

—— Lough Erne Drainage Scheme. Return for Report of Commissioners of Public Works, Ireland, with reference to. ERNE (Lough), 1891. Add. 499.

—— Lough Neagh District. Drainage and Navigation. MANNING (R.), 1884.

—— —— Flooded lands and improvement of the Navigation in the Loughs Neagh, Corrib Marsh, and Carra Districts. MACMAHON, 1845–46.

—— Meath, County of. MULVANY (C.), 1847.

—— Mullyfarry, Lake District, County of Mayo. BRETT (H.), 1846.

—— Shanagolden (Districts of) Limerick. NICHOLSON (S.), 1846.

—— Shanbogh District, County of Kilkenny. Report. LINEHAN, 1847.

—— Skane, River, District, County of Meath. NEVILLE (P.), 1847.

—— Waste Lands. Letter on the propriety of reclaiming them. SMYTH (G. L.), 1838.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Italy. CUPPARI, 1893.

—— (South), Marshes of. Land speculation and cotton growing. DENTON (J. B.), 1865.

Kent (West) Drainage Bill. Minutes of evidence, 1875. KENT.

Keyingham Level in Holderness drainage and navigation. CHAPMAN (W.), 1797, p. 242.

—— Drainage and improvement of Keyingham Level and the adjoining country. CREASSY, 1801.

—— Keyingham Level. GOLBORNE, 1779, 1800. Mr. Golborne's plan of draining. CHAPMAN (W.), 1800, p. 242.

Keythorpe System of Land Drainage—its principles, efficiency, economy, and opponents. TRIMMER (J.), 1855.

Lewes Laughton Level. Report concerning its drainage. SMEATON (J.), 1768, p. 208.

Lincoln and Boston, Drainage of Water between. GRUNDY, 1753.

Lincolnshire. Act for embanking and draining certain Salt Marshes and Low Lands, 1793, 1812, LINCOLN (County of).

—— Act for reclaiming from the Sea certain Lands abutting on the Coast of Lincolnshire, 1851. LINCOLN (County of).

—— (South) Fens of. History. WHEELER (W. H.), 1868.

Malden and Sheen. Bill for the more effectual Drainage of certain Lands in the Valley of. MALDEN, 1859.

Massachusetts. Mystic, Blackstone and Charles Rivers Valleys. Report of Commission on General System of Drainage. MASSACHUSETTS, 1886. Add. 519.

Muston Drainage Bill. Compensation for lands. MUSTON, 1800.

Nene. Amending the outfall of the, securing the Middle and North Levels of the Fens from inundation. EDWARDS (L.), 1771.

—— Nene Valley. RENDEL (J. M.), 1849.

—— Nene Valley Drainage and Navigation Reports. FOWLER (Sir John), 1858. Add. 501.

—— Improvement. OLVER, 1875.

Netherlands. Drainage Machinery of. HUET (A.), 1893. Add. 508.

Norfolk. Draining of marsh land in the County of. BATESON, 1710.

Nottingham. Low lands in the County of. Acts and amended Acts, 1796, 1801, '13. NOTTINGHAM.

Oxford. Valleys of the Thames and Cherwell, near. PHILLIPS (J.), 1874.

Potomac flats at Washington. Reclamation of. HAINS (P. C.), 1894. Add. 505.

Regent's Park Drainage, 1848. MITCHELL (D. W.).

Romney Marsh. Expense of Dymchurch Wall, 1764–1809. ROMNEY Marsh, 1810–37.

DRAINAGE OF LAND (SPECIAL)—*continued.*

Romney Marsh. Laws and Customs of Rumney Marsh. ROMNEY Marsh, 1726, 1840.

—— Expenses of the wall from 1810 to 1837, inclusive. HALLOWES (J.), 1837.

Taillau, Domaine du. BRYAS, 1855.

Thames (Lower) Valley Drainage. BUCHANAN (Dr. G.), 1878.

Thames Valley Drainage Works Proposed. Effect on the Hincksey Lake. PRESTWICH, 1884.

—— Manor of Imber, otherwise Imworther, 1607. DENHAM (J.), &c.

—— Thames Valley Drainage Acts, 1871 and 1874. FALKINER and Tancred, 1876.

—— Report on Drainage of Lands. HAWKSHAW, 1878.

Trent. GIBBS (L.), 1888.

Witham (River). Steam power applied to the Drainage of the fourth district. WELSH (E.), 1865.

Yorkshire. Various parishes of East Riding. HODGMAN, 1796.

Zeeland, regulations. CALAND (A.), 1857.

Zuider Zee reclamation. HUET (A.), 1890; BÜSING, 1894. Add. 489; KIELMANN, 1857; KREUTER, 1854, '87; SCHOUTE (P. H.), 1893.

See also BOGS.

DRAINAGE OF TOWNS (GENERAL REFERENCES).

HENROT, 1891; RAWLINSON (Sir R.), 1854.

Application of the Siphon. COWEN, 1853.

Bad Drains and how to test them. REEVES (R. H.), 1885.

Drains and Drainage Notes. SLACKE (W. R.), 1875.

Drainage for profit and for health. WARING (G. E.), 1879.

Evacuation of night-soil. Report on. TRÉLAT (E.), 1882.

Fowler's self-acting Water closet. FOWLER, 1874.

House drainage. OUGH, 1879; and Water Service. BAYLES, 1882; CHADWICK (Sir E.), 1884, p. 134; GRAY (J.), 1855; MIDDLETON (R. E.), 1881; PUTNAM (J. P.), 1886. Guildford. PILBROW, 1867.

—— Architects and House Drainage. WARING (G. E.), jun., 1886.

—— Architect's Letter on House drainage. MASTERS, 1876.

—— By-Laws and Regulations. FIELD (R.), 1877, '78.

—— Drainage and Ventilation of Houses. FIELD (R.), 1882.

—— Drainage and sanitary appliances of residences. COLYER, 1889.

—— Drainage of habitable buildings. BEARDMORE (W. L.), 1892.

DRAINAGE OF TOWNS (GENERAL REFERENCES)—*continued.*

House Drainage. Drainage of town houses.
LAWFORD (G. M.), 1892.

—— How to drain a house. READE, 1877; WARING (G. E.), 1885.

—— Information respecting House Drainage.
ATKINSON (J.), 1894.

—— Private Connections, House Drains, etc. McKIE, 1881.

—— Sanitary Drainage of Houses and Towns.
WARING (G. E.), 1878.

—— Sanitary Regulations and rules for house drainage.
CUTHBERT, 1884.

See also SANITATION.

Hydrosthetics of the Cistern, Drain and Sewer.
MORRIS (T.), 1878.

Information as to ventilating and flushing sewers.
BUCKHAM, 1884.

Law of Drainage and Sewers. KENNEDY and Sandars, 1884.

Lincoln's (Lord) Sewerage, Drainage, etc., of Towns Bill, 1846.
HEALTH.

Martin's improvements in apparatus and means used for draining towns, cities, etc. MARTIN (John), 1850.

Native Guano *versus* Sewage Water. ANONYMOUS, 1849, p. 49.

Pneumatic Drainage, Berlier System. SMITH (Adolphe), 1883.

Principles. LEE (W.), 1854.

Reform of the Sewers, or, manure wasted and land starved.
CLARKE (G. R.), 1860.

Rudimentary Treatise. DEMPSEY, 1867, 1887.

Scheme for effectual Drainage. ANONYMOUS, 1855, p. 55.

Separate system. MONSON, 1875.

Sewerage of Towns. DENTON (J. B.), 1855.

Sewerage, Irrigation. LATHAM (B.), 1867–71.

Sewerage and Land-Drainage. WARING (G. E.), 1889.

Sewerage works in Urban Districts. VAWSER (R.), 1886.

Subsoil drainage, foundations, etc. SLACKE (W. R.), 1875, 1878.

Systems of evacuation of water and filth.
OVERBECK de Meijen, 1883.

Town Sewage Question. CHILD, 1865.

Vitrified *versus* porous Drain Pipes. ANONYMOUS, 1856, p. 58.

Wharncliffe's (Lord) letter on Draining. Reply to.
DAVIS (H.), 1851.

DRAINAGE OF TOWNS (SPECIAL).

Adelaide. ADELAIDE, 1878; CLARK (W.), 1878.

Aldershot. Report. ALDERSHOT, 1870.

Alnwick. BALFOUR (D.), 1892.

Atlanta, Georgia. Sewerage. HERING (R.), 1891.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Bann Drainage Bill. BANN, 1889.
Batley. Proposed scheme of sewerage and disposal of sewage. HILDRED, 1874.
Beckenham Drain. ATKINSON (W.), 1870.
Belfast. BRETLAND, 1883.
—— Main Drainage. Specifications and drawings. BELFAST, 1888.
—— Specifications. MONTGOMERY (J. J.), 1869–83.
—— Reports. MONTGOMERY (J. J.), 1866, 67, 75.
Berlin. BERLIN, 1879; LOSSEN, 1879; WIEBE (E.), 1861.
—— Drainage and Sewerage system. SILK (A. E.), 1894.
Beverley and Barmston. Report of Commissioners. BEVERLEY, 1804.
—— Drainage. HALL (James), etc., 1859.
—— Drainage Bill. BEVERLEY, 1880.
Binghampton, N.Y. System of sewerage. HERING (R.), 1882. Hering's project. WARING (G. E.), jun., 1883.
Birmingham. Liernur system of Drainage. SCOTT (A.), 1876.
—— Sewerage Bill. Evidence before Parliamentary Committee, etc. SCOTT (T. W.), 1872.
Blackburn, Borough of. Details of House Drainage. MACCALLUM, 1890.
—— Municipal and Sanitary Works. MACCALLUM, 1885.
Bombay, 1863. INDIA, p. 111.
—— Reports 1855, '57, '58, '61. INDIA, p. 114.
—— Main drainage. AITKEN (R.), 1866, 1867.
—— Drainage and Sewerage of Bombay. Reports, etc. TULLOCH (H.), 1868, 1872.
Boston. Pumping plant, 1885. Pumping machinery, 1884. LEAVITT (E. D.).
Boston [U.S.]. CLARKE (E. C.), 1885, 1888.
—— Sewerage. BOSTON, 1871, 1876.
—— Sewage Question. FOLSOM, 1877.
Bournemouth Drainage. Vindication of the rock Concrete Tubes. SHARP, Jones and Co., 1879.
Bristol. GREEN (J.), 1848.
Buenos Ayres. BATEMAN (J. F. La T.), 1871; BUENOS AYRES, 1887.
Burnley. Intercepting and Outfall works. BRYAN (W. B.), 1878.
Cairo. Report. LATHAM (B.), 1890.
Calcutta. Official Papers, 1863–68. INDIA, p. 115.
California. Special message to the Legislation of the State of (on the Drainage of California). PERKINS (G. C.), 1881.
Cambridge. Sewage Report. STEPHENSON (G. W.), 1870.
—— Sewerage. SHONE (I.), 1879.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Cannes. Sewerage on the Shone System. Report. SHONE (I.), 1885.

—— Works of Sewerage and Drainage, proposed. GALTON, 1883.

Canterbury. PILBROW, 1867.

Castleford and Whitwood Main Drainage, 1875. PATERSON and Wheater.

Chelsea, U.S. Drainage Construction Company *v.* City of Chelsea, U.S. Pleadings and Evidence. DRAINAGE, 1889

Chicago. CHICAGO, 1887

Christchurch. CLARK (W.), 1878.

Cleveland. System of main sewerage. HERING (R.), 1882.

Columbia, District of. Sewerage. HERING (R.), etc., 1890.

Columbus, Ohio. Sewerage of. WARING (G. E.), 1890.

Concepción. CONCEPCION, 1892.

Croydon. ARNOTT and Page, 1853.

—— Epidemic, 1853. CROYDON.

—— Proposition to discharge portion of the Sewage into a sewer under the jurisdiction of the Metropolitan Board of Works. CROYDON, 1862.

—— Reports on the Sewerage. CROYDON, 1853.

Danzig. DANZIG, 1881; WIEBE (E.), 1865.

Delhi. Report. GREATHED, 1852; INDIA, 1852, p. 118.

Dorking. System of Sewerage. DORKING, 1893.

Dortmund, drainage of. MICHAELIS and Gordon, 1878; MITTERMAIER, 1878.

Driffield. Report, 1874. OLDHAM and Bohn.

—— Specification of Works in earthwork, concrete, brickwork, ironwork, and iron and earthenwork pipes, 1878. OLDHAM and Bohn.

Dublin Sewage. Applying Hydraulics to design for Sewage works, etc. SMITH (John A.), 1885.

—— Main Drainage Outfalls. GRIFFITH (J. P.), 1885.

—— Report of Royal Commissioners. DUBLIN, 1880.

Dudley. MARTEN (H. J.) and Stileman, 1876.

Dunedin. Sanitary Commission on Sewerage and Drainage. DUNEDIN, 1865.

Elberfeld. LINDLEY (W. H.), 1882, '93.

England, Sewage-works of some towns in, Report. ROWE (R. R.), 1869.

Eton College and Eton. ROE (J.), 1842.

Europe. PORTUGAL, 1880.

Florence. TURIN, 1886.

France. Instructions. FRANCE, 1865, p. 436.

Frankfort-on-Main. LINDLEY (W. H.), 1886.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Frankfort-on-Main Drainage. PULS (O.), 1886.
Geneva, N. Y. Sewerage. CROES, 1884.
Georgetown, Demerara. Drainage and Sewerage. Report. GEORGETOWN, 1880.
Glasgow, deodorizing the sewage. ANDERSON (T.) & Bateman, 1858.
Halifax Sewer Works. Specifications. HALIFAX (1874 ?).
Hampstead, Frognal and Oak Hill Park. HAMPSTEAD, 1892.
Heilbronn. GORDON (J.), 1876.
Heston and Isleworth Local Board. House Connections with Sewers and Drainage of Houses. HESTON, 1890.
Homburg. LINDLEY (W. H.), 1886.
Hongkong. Proposed drainage of the City of Victoria. LEIGH (R. K.), 1888.
Hornsey. HORNSEY Local Board, 1886.
—— Northern portion of the District. HORNSEY Local Board, 1885.
Houghton-le-Spring. BALFOUR (D.), 1876.
Huyton-with-Roby. Sewerage. HUYTON-with-Roby, 1875.
Ironton, Ohio. Sewerage system. HERING (R.), 1891.
Karlsruhe drainage. CARLSRUHE, 1881.
Keene and Laconia, sewerage of. Two New Hampshire towns. WARING (G. E.), 1892.
Kingston, Jamaica. Sewerage of. WARING (G. E.), 1887.
Kingston-upon-Hull. Report on the outfall drainage of the West District. SHARP (J. F.), 1862.
Laneham Drainage. CHAPMAN (W.), 1813, p. 241.
Leeds. Report on the sewerage of, under the Leeds Improvement Act. VETCH (J.), 1843.
Leicester. GANT, 1873. Report, 1845. LEICESTER.
—— Report on the Sewerage, Drainage, etc., and a report upon the analysis of the sewerage water, etc. WICKSTEED (T.), 1850.
Lincolnshire Sewers. Burgh, etc., Drainage Reports. WILLIAMS (John E.), 1880–1.
Liverpool. Mr. Rennie's Report on the Sewerage. RENNIE (J.), 1846.
Lochee. GREIG, 1883.
London. City Drainage. ANSLEY (G. D.), 1879. Add. 481.
—— Metropolitan Drainage Reports. NEVILLE, 1858.
—— Metropolis Sewerage districts. SMITH (Joshua Toulmin).
—— London and other large towns. COPLAND, 1855.
—— Drainage of Cities. Sewage kept for use. Rivers kept clean (especially applicable to the Thames). SPURGIN (J.), 1858.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

London. BRYSON (J. M.), 1858; DENTON (J. B.), 1849; JEBB, 1854; PHILLIPS (J. O.), 1885; WRIGHT (A.), 1856.

—— Main Drainage. BAZALGETTE (Sir J. W.), 1855, 1857; BIDDER, 1858.

—— Contract Drawings. BAZALGETTE (Sir J. W.), 1859–73.

—— Specifications. BAZALGETTE (Sir J. W.), 1859–73.

—— Main Drainage of London. BAKER (Sir B.) & Binnie, 1891.

—— Main Drainage System, working of. CRIMP, 1893.

—— Metropolitan Main Drainage. FOLSOM, 1876; LATHAM (B.), 1883.

—— Sewage interception and main drainage of the districts north and south of the Thames. BAZALGETTE (Sir J. W.), 1856.

—— Tenders for the southern sewage. BAZALGETTE (Sir J. W.), 1865, 1867.

—— Northern and southern drainage. BAZALGETTE (Sir J. W.), 1856.

—— Requirements which the Main Drainage is and is not intended to answer. BAZALGETTE (Sir J. W.), 1871.

—— Scheme for main drainage of the districts north of the Thames. LAW, 1855.

—— Metropolitan Board of Works. Inspection of Manure and Chemical Works in the neighbourhood of the northern and southern outfall. LETHEBY & Bazalgette.

—— Plans for the Drainage of London, 1857. LONDON, p. 256.

—— Objections to plan suggested by Galton, Simpson, and Blackwell, 1857. LONDON, p. 256.

—— Request for further information, 1858. LONDON, p. 256.

—— Main Drainage. Report by Bidder, Hawksley and Bazalgette, 1858. LONDON, p. 256. Answer to this report by the Government Referees. LONDON, p. 256. Observations on answer, by Bidder, etc., 1858. LONDON, p. 256. Letter of Government Referees on Observations, 1858. LONDON, p. 256.

—— Letter from G. P. Bidder on the Drainage, 1858. LONDON, p. 256.

—— Metropolitan Main Drainage Contract. Drawings by J. W. Bazalgette, 1859–73. Specifications, 1859–73. LONDON, p. 256.

—— Report of Committee, 1862. LONDON, p. 256.

—— Western Pumping Station. Specifications of Engines and Buildings, 1872. LONDON, p. 257.

—— Scheme of London Drainage Company. Report by J. W. Bazalgette and W. Haywood. LONDON, p. 256.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

London. Reports and Communications of the Board of Health on the Drainage of the Metropolis, 1854. LONDON, p. 256.

—— High level for the interception of the drainage north of the Thames, and the intercepting lines south of the river, 1853. LONDON, p. 256.

—— Report upon Bill of Quantities for the Northern high-level sewer. POLE (W.), 1859.

—— Sewage Interception and Main Drainage of the district North of the Thames Report. STEPHENSON (R.), 1854.

—— London Main Drainage. Memorandum on the data employed in determining the size and estimating the cost of the works designed for. WARD (F. O.), 1855.

—— Lower Thames Valley Union proposed by the Surbiton Commissioners. COX (P.), 1876.

—— Application from the Local Board of Hampton Wick to the Local Government Board. COX (P.), 1877.

—— Lower Thames Valley Main Sewerage Board. HARRISON (J. T.), 1880.

—— Lower Thames Valley, Brent and Lea Drainage High Level Northern Route to Sea Reach. MANSERGH, 1885.

—— Lease to Mrs. Corbett of the East Moulsey Glebe. Indenture. REYNOLDS (O.), and Corbett, 1879.

—— Objections to Mr. Hayward's scheme. RICHARDSON, Rowley and East, 1880.

—— Lower Thames Valley Main Sewerage. ROBINSON. (Prof. H.), 1885; SHONE (I.), Ault & Donaldson, 1884.

—— Report on the Lower Thames Valley Main Sewerage. ROBINSON (Prof. H.), and Melliss, 1878.

—— Thames Valley. Preparation of plans as to Main Sewerage and Drainage and Water Supply. THAMES Valley, 1873.

—— Lower Thames Valley. Account of schemes for the disposal of the Sewage of Towns in THAMES Valley, 1884.

—— Lower Thames Valley Main Sewerage Bill, Report on. THAMES Valley, 1884.

—— Thames Valley Sewerage, Report of Col. Cox. THAMES Valley, 1876.

—— Lower Thames Valley Main Sewerage Board. Bill to extend its powers and Petition against it, and Debate on its Second Reading. THAMES Valley, 1879.

—— Lower Thames Valley Main Sewerage. Haywood's, Mansergh, and Melliss' Scheme, Minutes of Evidence on. THAMES Valley, 1880–4.

—— Lower Thames Valley Sewerage Board. A petition for a provisional Order for compulsory taking of land. THAMES Valley, 1884.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

London. Thames Sewerage Commission. Plan for purifying the Thames from Sewage between the Metropolis and Windsor. BAZALGETTE (Sir J. W.), 1871.

—— Main features of the plans for the Drainage of the Metropolis, 1840. LONDON, p. 255.

—— Drainage North of the Thames. Engineer's Report, 1851. LONDON, p. 255.

—— Debates and questions in Parliament relating to the Main Drainage, 1882. LONDON, p. 255.

—— Great London Drainage Scheme and Victoria Street Sewer, 1853. LONDON, p. 256

—— Great London Drainage Bill, Minutes of Evidence, 1853. LONDON, p. 256.

—— Sewage on the south side of the Thames (Metropolitan Board of Works). ELLIS (T.), 1866.

—— Thames Reform: a new plan for the drainage of the Metropolis. WORSLEY (Sir W.), 1856.

—— Boring Operations at the Crossness pumping station. BAZALGETTE (Sir J. W.), 1869.

—— Thames Conservancy and Main Drainage Outfalls, Report on the Arbitration. BAZALGETTE (Sir J. W.), 1880.

—— Plans of Captain J. Vetch for the Sewerage of the Metropolis. GORDON (L. D. B.), 1851.

—— Drainage By-Laws as administered under the Metropolis Local Management Acts. TIDMAN (E.), 1889.

—— Project for the Drainage and Sewerage. MURRAY (John), 1852.

—— City of London Sewers. Report, etc. WALKER (James), Cubitt and Brunel, 1848.

—— Metropolitan Commission of Sewers. Court Minutes Jan., 1849, July, 1852, and Nov., 1854. LONDON. Add. 516.

—— Report on that portion of the main intercepting drainage called the Northern Drainage. ROE (J.), 1854.

—— Metropolis Southern Sewerage utilization. SMITH (R.), 1867.

—— Suggested works on the Thames. HALL (M.), 1852.

—— Proposed aqueduct sewer from extreme west of the Metropolis to the Thames at Barking Creek. BEARDMORE (N.), 1850.

—— Disposal of the Sewage. DENTON (E. F. B.), 1887.

—— System of Pipe Drainage, unsuccessful results. ANONYMOUS, 1852, p. 49.

—— Metropolitan system of Drainage and the interception of Sewage from the Thames. BAZALGETTE (Sir J. W.), 1865.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

London. Outfall of the Main Drainage and intercepting sewers. AUSTIN (A.), 1856.

—— Kensington Drainage. PHILLIPS (J.), 1846, 1847.

—— Lisson Grove Drainage. PHILLIPS (J.), 1846.

—— St. Giles in the Fields. Drainage. WOOLRYCH (E. H.) 1852.

—— Temple (Middle). Contract drainings. REDMAN (J. B.), 1849.

—— Westminster. Improvement of the Drainage of that district now drained by the King's Scholar's Pond Sewer. RENNIE (Sir J.), 1846.

—— —— Drainage of the Westminster Abbey precincts. AUSTIN (H.), and Lovick (T.), 1849.

Louth. GANT, 1874.

Ludwigshaven. GORDON (Joseph), 1878.

Madras. CLARK (W.), 1875.

—— Report on a project for the Drainage of. TULLOCH (H.), 1865.

Maldon, Essex, Sewerage. GRANTHAM (R. F.), 1891.

Manchester. MANCHESTER, 1845.

Mannheim, between the Neckar and the Rhine. LINDLEY (W. H.), 1890.

Margate. Report. LATHAM (B.), 1877.

Massachusetts Drainage Commission. Report. WARING (G. E.), 1886.

Melbourne Drainage. Critique on Mr. Mansergh's report. SHONE (I.), 1891.

Memphis. System of Sewerage at Memphis and elsewhere. WARING (G. E.), 1893.

Milan. BIGNAMI-SORMANI, 1868.

Munich. GORDON (J.), 1876; ECKERT (K.), 1879.

Muston. General principles of public drains. CHAPMAN (W.), 1803, p. 241.

New South Wales. Manly. Report on Drainage Works, 1888. MANLY, N.S.W.

Newport. CLARK (G. T.), 1850.

Nottingham Sewerage and River Conservancy, Account of. TARBOTTON (M. O.), 1875, '86.

Nuremberg. GORDON (Joseph), 1876.

Ossett Main Drainage. Report, 1874. PATERSON (M. M.).

Oswego, N.Y. Rules and Regulations relating to Plumbing, Drainage, and Ventilation, 1893. OSWEGO, N.Y.

Oxford Main Drainage. CUBITT (Sir W.), 1851; WHITE (William Henry), 1877.

—— Oxford, Eton, Windsor, Abingdon. EWART (C. B.), 1868.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Paris. Health Department, 1871, '90. PARIS, p. 460.

—— Sewage water utilised, and the purification of the Seine. STOFFEL (L. M.), etc., 1873.

—— Sewerage of Paris. WARING (G. E.), 1887; EMMERY, 1837, '53.

—— Water and Sewerage Department, 1879. PARIS, p. 460.

Patrington. Specification of Works in earthwork, concrete, brickwork, ironwork, and iron and earthenware pipes, 1878. OLDHAM and Bohn.

Peterborough. ADDY, 1874.

Philadelphia. HERING (R.), 1881.

—— Drainage Question. WARING (G. E., jun.), 1885.

—— House and Street Drainage. HERING (R.), 1878.

Port Louis, 1870. PORT LOUIS.

Portsmouth Drainage and a scheme for amending it on the Shone Pneumatic System. SHONE (I.) and Wallis, 1882.

—— Sewerage. ANGELL (L.), 1864.

Potsdam. Shone System. KNAUFF, 1885.

Providence, U.S. GRAY (S. M.), 1884.

Providence, R.I., Sewerage and Sewage Disposal. WARING (G. E.), 1885.

Rangoon. Sewerage on the Shone Hydro-pneumatic system. SHONE (I.), and Ault, 1892.

Raventhorpe Branch Drainage. Report, 1875. PATERSON (M. M.).

Richmond, Surrey. DONALDSON (G.), 1849, 1856.

—— Richmond Main Drainage Plan for dealing with the Sewage of Richmond, Barnes, Mortlake, Kew, and Petersham. MELLISS, 1885.

Rio de Janeiro, Drainage of. Specification. RIO de Janeiro, 1859.

Rugby, Sandgate, Tottenham, St. Thomas's Exeter, and Barnard Castle. BAZALGETTE (Sir J. W.), 1854.

St. John's, Newfoundland. System of sewerage. HERING (R.), 1889.

Sandgate Drainage in connection with the outbreak of Cholera. Report. SANDGATE, 1855.

Sebastopol Plateau and Durham Lead. Proposed underground drainage Scheme report. SEBASTOPOL, Victoria, 1878.

Shanagolden District, County Limerick. Supplemental Report. CONEYS, 1849.

Sioux, City of, Falls. Sewerage system. HERING (R.), 1893.

Skegness. BALFOUR (D.), 1876.

Southampton Sewerage Report. SIMPSON (J.), 1855.

Southport Drainage by Gravitation, and disposal of Sewage. Report, Letter and Speech on. SHONE (I.), 1883.

DRAINAGE OF TOWNS (SPECIAL)—*continued.*

Southport. Report on Crossens Channel new cut. VERNON HARCOURT, 1884.

Spezia. RADDI, 1886.

Stansty. Report on the gravitating Sewerage Schemes, with proposals for sewering the same on Isaac Shone's Pneumatic System. SHONE (I.), 1879.

Stapleton, Co. Gloucester. CURTIS (J. P.), 1880.

Stockport Sewage Scheme Report. STOCKPORT, 1892.

Stratford-on-Avon. Sewerage and Sewage Disposal. DAVIS (A. F.), 1886.

Stuttgart. GORDON (Joseph), 1874, '76.

Superior, City of, sewerage system. HERING (R.), 1893.

Sydney City and Suburban Sewage and Health Board Reports. SYDNEY, 1875–76, 1888, pp. 272, 273.

—— Drainage Works Act. SYDNEY, 1889, p. 273.

—— Drainage Works Report. Reticulation Report, and City Surveyor's Report on Disposal of Refuse by towing out to sea. SYDNEY, 1889–91, p. 273.

—— North Shore Drainage Works. SYDNEY, 1888, p. 273.

—— Sewerage Reports. SYDNEY, 1855–82, p. 272.

—— Sewerage Reports. SYDNEY, 1889–90, p. 273.

—— Street and House Garbage, Refuse, and Nightsoil. Removal and Destruction. SYDNEY, 1885, p. 273.

Toronto. Disposal of sewage. HERING (R.), and Gray, 1889.

Torquay Drainage. TORQUAY, 1884.

Tottenham and Wood Green Sewerage Bill. Report from Select Committee on, etc. TOTTENHAM, 1891.

Trenton, N.J., Sewerage system. Report of the Sanitary Committee. TRENTON, N.J., 1885.

Truro Main Drainage, Problem. Special Council meeting, etc. TRURO, 1888.

Turin. BIGNAMI-SORMANI, 1885; RADDI, 1891.

Uppingham Sewage and private Drainage. FIELD (R.), 1876.

Warsaw Drainage. WARSAW, 1879, 1890.

Waterbury, Conn., sewerage works. HERING (R.), 1882.

Wellington, City of. CLARK (W.), 1878.

Wellington, N.Z. Report on the Sewage. CUTHBERT and Ferguson, 1890.

Wilmington. System of sewerage. HERING (R.), 1883.

Wimbledon. Main Drainage and Sewage Disposal Works. CRIMP, 1888.

Wolverhampton. Sewerage scheme and ventilation of home drainage. BROOM, 1878.

See also SEWAGE. SEWERAGE (Places).

DRAUGHT. Effect of forces applied to. RANKINE (D.), 1828.

DRAWING.

Appleton's Cyclopædia of drawing. APPLETON (D.), 1869.

Architectural Drawing, application of Geometry to. BURN (R. S.), 1853.

Geometrical and Engineering. PIGOT, 1879; PORTLOCK, 1858.

Instructor in Drawing and Working the five orders of architecture. NICHOLSON (P.), 1839, '45.

Isometrical drawing as applicable to geological and mining plans. SOPWITH (T.), 1834, p. 225.

Lineal Drawing. FRANCŒUR, 1835.

Linear Drawing. Introduction to technical drawing. MAST, 1874.

Map and Plan Drawing. KING (C. C.), 1873.

Mechanical Drawing. ABORN, 1886; HALLIDAY (G.), 1889.

Topographical Drawing. SMITH (R. S.), 1882.

Treatise of Projection, first principles of plans and elevations. NICHOLSON (P.), 1837.

Projection and artistic drawing. SMITH (James), Architect, 1843.

Working drawings and how to make and use them. HAUPT (L. M.), 1881.

DRAWING INSTRUMENTS. Descriptive Treatise on Mathematical Drawing Instruments. STANLEY (W. F.), 1866, 1878.

DREDGING.

Dredge Illustrations. BUCYRUS Steam Shovel and Dredge Company, 1892. Add. 489.

Results of the dredging [natural history] cruises of H.M. Ships "Porcupine" and "Lightning" during the summers of 1868, '69 and '70. THOMSON (Sir C. W.).

Clyde. On the Dredging of the lower estuary. STEVENSON (C. A.), 1887.

—— Disposal of Dredgings. KIDSTON, 1862.

Italy. Rock dredging works in some Italian Harbours. CIMINO, 1893.

New South Wales. Report by the Engineer-in-Chief on Dredging Operations, 1889–91. NEW South Wales, p. 401.

St. Nazaire, Bremerhaven, Oakland and St. Petersburgh Harbours. Dredging operations at. TIMONOFF (V. E.), 1892.

DREDGING MACHINES.

Dredging machine. ANONYMOUS, 1843, p. 51; SALOMON and Forchheimer, 1888.

Dredging and Dredge Plant. BROWN (A.), 1874, 1889; SCHÖNBERG (A. C.), 1890.

Automatic gear for working the larger sizes of Bull's patent dredgers. BULL (W.), 1886.

DREDGING MACHINES—*continued.*
Molesworth Ratchet Dredger. MOLESWORTH, 1874.
Patent Hydraulic Deepener. AFFLECK, 1833.
Steam Dredgers. HAGEN (L.), 1887.
Use of the under-excavating or Steam Dredging Engine. ARCHER (T.), 1829.
Bristol Docks. New dredger. GIRDLESTONE, 1886.
Clyde Navigation. Dredging Plant. DEAS, 1892.
—— Report on Hopper Barges. KIDSTON, 1862.
Cork Harbour. BENSON, 1872.
Mersey Docks and Harbour Board. New Sand Dredge "Brancker" for the. BLECHYNDEN, 1893
New South Wales. Report. NEW SOUTH WALES, 1881, p. 401
Queensland. American Dredges, QUEENSLAND, 1877, p. 71.
—— Contract for new dredge or dredges. QUEENSLAND, 1879, p. 71.
—— Dredging Plant. QUEENSLAND, 1876, p. 70.
—— Groper Dredge. QUEENSLAND, 1877, p. 71.
Sinclair's-birth Bay. Machine for lifting a cargo of iron sunk in 1829, buried in the sand six feet. BREMNER, 1836.

DRILL IN SCHOOLS. CHADWICK (Sir E.), 1885, p. 236.

DRILL. Potato drill machine. RANDALL, 1764.

DRILLING APPARATUS.
Drilling apparatus for Water and Gas Mains. PEARSON (H. W.), 1891, '92.
DRILLING MACHINE (SQUARE). BOLTON (R.), 1892.

DRILLS. *See* ROCK DRILLS.

DRINKS. What shall we drink? GOSLIN, 1883.

DROWNING.
Table for the reviving of drowned persons. POUCHET, 1840; POUCHET, App. 572.
Will a drowned person be raised by the discharge of a cannon? CUENTO, 1884.
DRUGS. Cultivation and uses. CHRISTY (T.), 1882.

DRY ROT. DICKSON (R.), 1838. In Buildings. RANDALL (James), 1807. In Timber. Practical observations. DODD, 1815.
Cause of, discovered. GEORGE (J.), 1829.
Causes and origin of the dry rot. LINGARD, 1819, '27.
Means to preserve the British Navy from dry-rot. KNOWLES (J.), 1821.
Origin and Operation. MCWILLIAM, 1818.

DRYING.

Machine for drying and pulverising blood, excrementitious matter, etc. FARMER, 1883.

Patent Concentrator or mechanical Dryer. FORREST, 1881.

DUST. Method of collecting Flue Dust. EGLESTON, 1883.

DWELLINGS OF THE POOR. *See* HOUSING of the Working Classes.

DYEING. CRACE-CALVERT, 1876; BERTHOLLET, 1824.

Dyeing and Bleaching. BEVAN (G. P.), Industries, vol. 6.

Dyeing and Tissue Printing. CROOKES, 1882.

Dyeing and Calico Printing. CROOKES, 1874.

DYKES.

Construction. CALAND (A.), 1833.

Zealand, Atlas of plates. ORDT, 1860.

DYNAMICS. COLLIGNON (E.), 1885; EARNSHAW, 1844; GREENHILL (A. G.), 1893; PINKERTON (R. H.), 1888; WARR (G. F.), 1851; WHEWELL (W.), 1823.

Dynamics of Magnetism, Electricity, Heat, Light, Crystallization and Chemism in relation to vital force. REICHENBACH, 1851.

Diagram of speed and acceleration. MOHR (O.), [1888].

Dynamics of a Particle. TAIT (P. G.) and Steele, 1865.

Electro Dynamics. Manual. CUMMING, 1827.

Force of falling bodies and dynamics of matter. NYSTROM, 1873.

Principles and practice. BAKER (T.), 1851; NYSTROM, 1874.

Rigid Bodies. Treatise on the Dynamics of a system of. ROUTH (E. J.), 1860.

Rotation, Dynamics of. WORTHINGTON (A. M.), 1892.

Solution to the celebrated fundamental question (hitherto unsolved). GARDINER (M.), 1883.

See also MECHANICS. MOTION.

DYNAMO ELECTRIC MACHINES. *See* ELECTRICITY (dynamos).

DYNAMOMETERS.

Dynamometers and the Measurement of Powers. FLATHER, 1892.

Dynamometric Apparatus. MORIN, 1841.

New Dynamometer. FROUDE (W.), 1857.

Transmission Dynamometer for expresses. RAFFARD, 1890.

E.

EARTH.

Calculation of the Age of the Earth. READE, 1883.

Creation and Physical Structure. HARRISON (J. T.), 1889.

Cooling (Secular) of the Earth. READE, 1887. Secular straining of the Earth. READE, 1890.

Density of the Earth. Experiments to determine. CAVENDISH, 1798. App. 551. Pendulum experiment made in Harton Colliery for ascertaining. AIRY (Sir G. B.), 1855, p. 21.

Figure of the Earth. AIRY (Sir G. B.), 1850, p. 23; BAKEWELL (F. C.), 1862; LAPLACE, 1818, 1819; MAUPERTUIS, 1738; MERRIMAN, 1881.

—— Curvature of the Earth. CARLETTI, 1882.

—— Determined by the pendulum. BRUSSELS, 1876; SABINE (Sir E.), 1825.

—— By measure of arcs. BRUSSELS, 1876.

—— Dimensions and mean specific gravity of the Earth. CLARKE (A. R.), 1858.

—— Ellipticity of the Earth. PRITCHARD (C.), 1831.

—— Method of ascertaining, by means of Occultations of the Fixed Stars. CAGNOLI, 1819.

—— Method of investigating the Ellipticity of the Earth, considered as a heterogeneous spheroid. PRITCHARD, 1831.

—— Precession and Nutation. AIRY (Sir G. B.), 1831, p. 17.

—— Water. Experimental proofs that the surface of standing water is not convex, but horizontal [by J. Hampden]. ANONYMOUS, 1870, p. 45.

—— Are rivers, lakes, seas, and oceans flat or round, plane or spherical? [by J. Hampden]. ANONYMOUS, 1870, p. 46.

—— Is Water level or convex? John Hampden triumphant. HAMPDEN, 1870, '71.

—— Not a globe (water not convex). CARPENTER (W.), 1871.

—— *See* PENDULUMS.

Formation of the Earth. Dynamical Theory. RITCHIE (A. T.), 1850.

Interior of the Earth. Probable condition of. AIRY (Sir G. B.), 1878, p. 21.

Motions of Fluids and Solids relative to the Earth's surface. FERREL, 1860.

Orbit, eccentricity of. AIRY (Sir G. B.), 1880, p. 22.

EARTH—*continued.*

Physical theories of the Earth in relation to mountain formation. READE, 1889.
Physics of the Earth's crust. ANONYMOUS, 1850, p. 40; READE, 1890.
Rotation of the Earth. LAPLACE, 1821. Plato's doctrine and Aristotle's comment. GROTE (G.), 1860.
System of the World. COLLIN, 1846; LAPLACE, 1813, 1836.
Temperature of the Earth's crust. READE, 1891.

EARTH WAVES.

Earth Wave at destruction of Flood Rock, New York Harbour. ABBOT (H. L.), 1885.
Velocity and Transmission of Earth Waves. ABBOT (H. L.), 1878.

EARTHQUAKES. ZURCHER (F.) & Margollé, 1884.
Aseismatic arrangement, adapted to structures in earthquake countries. STEVENSON (D.), 1868.
Catalogue of the British Association. MALLET (R. & J. W.), 1858.
Cause of activity. PEACOCK (R. A.), 1877
History and philosophy of Earthquakes. ANONYMOUS, 1757, p. 46.
Measurement. EWING, 1883.
Observations of Earthquake Phenomena. MALLET (R.), 1859.
Principle that may be employed in Earthquake measurement. PERRY (Prof. J.) & AYRTON, 1877.
Protection of Buildings. CERERO, 1890.
Resistance of buildings against Earthquakes. FAVARO, 1883.
Saturated Steam the motive power. PEACOCK (R. A.), 1882.
Structures, effect on. Notes on recent publications. POWNALL (C. A. W.), 1891.
Structures in an Earthquake country. PERRY (Prof. J.) & AYRTON, 1878.

British Earthquake, Nov. 9, 1852. MALLET (R.), 1854.
—— East Anglian, 1884. Report. MELDOLA and White.
California, 1890 and 1891. HOLDEN (E. S.); KEELER, 1890; 1892 & 1893; PERRINE (C. D.). Add. 528.
—— Oregon and Washington Territory. List of recorded earthquakes. HOLDEN (E. S.), 1887.
Charleston, S.C., examination of buildings injured. CHARLESTON, S.C., 1887.
—— Photographs, 1886. CHARLESTON, S.C.
Ischia, Isle of. BALDACCI, 1883, '85; JOHNSTON-LAVIS, 1885.
Japan. Construction in Earthquake Countries. MILNE (John), 1887

EARTHQUAKES—*continued.*

Japan. System of Construction intended to give security to constructions in masonry. LESCASSE, 1877.

—— Earthquakes and other Earth Movements. MILNE (John), 1886.

—— Earthquake effects, emotional and moral. MILNE (John), 1887.

—— Earth Tremors in Central Japan. MILNE (John), 1887.

—— Great Earthquake, 1891. MILNE (John) and Burton, 1891.

—— Seismic Survey made in Tokio in 1884 and 1885. MILNE (John), 1887.

—— Seismological Journal of Japan. PERIODICAL PUBLICATIONS, p. 24.

—— Seismological Society of Japan. Transactions, 1880–92. SEISMOLOGICAL Society.

Krakatoa, Eruption of. Report of the Committee. ROYAL Society, 1888.

Naples. Great Neapolitan Earthquake of 1857. MALLET (R.), 1862.

Nicaragua Canal. Possible effects of Earthquake shocks on the structure of the. DUTTON (C. E.), 1891.

EARTHWORKS. GOBIN (A.), 1884; GRAHAM, 1863; THOMASON Civil Engineering Coll., 1853–4, 1862–4.

Calculating cost of earthwork. KREUTER (F.), 1887.

Calculation of Earthwork. CUNNINGHAM (D.), 1865; LALANNE, 1879.

Directions for estimating the cost of Earthworks. TRAUTWINE (J. C.), 1887.

Lateral (actual) pressure of Earthwork. BAKER (Sir B.), 1882.

Measurement, rules for. MORRIS (E.), 1872.

—— Earthwork Measurer. BRANFILL, 1877.

Ploughing Machines in the construction of Military Earthworks. Application. WEBBER (Maj.-Gen. C.E.), 1863.

Pressure of Earth. CURIE, 1873; HAGEN (G.), 1871; MAYNIEL, 1808; WEYRAUCH, 1881.

Pressure of sandy earth. SAINT VENANT (A. J. C. B. de), 1884; BOUSSINESQ (J.), 1884.

Profile of earthworks. A quick process for determining their surface and declivity. SWITKOWSKI (M.), 1884.

Resistance required to sustain banks of earth, Formulæ for finding maximum amount of.

Shrinkage of Earthwork. FLYNN, 1885.

Slips (Earthwork) and Subsidences upon Public works. NEWMAN (J.), 1890.

Spontaneous sliding of clayey ground. COLLIN, 1846.

Stereometric Tablet for the Computation of Earthworks. WARNER (J.), 1863.

EARTHWORKS—*continued.*

Tables. BUCK (J. H. W.), 1885; GALLOTT, 1884; HALES (W. P.), (1881?); MERTH (L.), 1873. NEALLY, 1880.

—— Bidder's Earthwork Tables for use of the Public Works Department in India. O'CALLAGHAN, 1865.

—— Metrical Earthwork Tables for finding the contents of earthworks. GREENBANK and Pigot, 1866.

—— Table for facilitating the Calculation of Earthworks for Railways, Canals, etc. BASHFORTH, 1847.

—— Tables for Calculation of Earthwork in the formation of Railways, Roads, and Canals. HUNTINGTON, 1846, '47.

—— Tables for estimating contents of Earthwork of railways and other public works in cubic yards. SIBLEY (C. K.), and Rutherford, 1847.

Theorems (New), Tables and Diagrams for Computation of Earthworks. WARNER (J.), 1861.

Theory of earth pressure and calculation of retaining walls. KREUTER (F.), 1877.

Universal scale for measuring Earthwork. HEALD (G.), 1839.

Ohio Earthworks and Mounds, etc. SMITHSONIAN Inst., 1889, 1891; THOMAS (Cyrus), 1889.

Sind. PRICE (W. H.), 1874.

See also RAILWAYS (Earthworks).

ECCLESIOLOGY.

Ecclesiologist. PERIODICAL PUBLICATIONS, p. 14.

Sketches of Continental Ecclesiology. WEBB (B.), 1848.

ECONOMIC PRODUCTS. Punjab. POWELL (B. H.), 1868–72.

EDDIES, propagation of. BIDONE, 1820, 1825.

EDUCATION.

Art Education. PAPWORTH, 1889.

Artillery and Engineers, joint education of the, injurious to the public service. ANONYMOUS, 1873, p. 47.

Classical Instruction. ANONYMOUS, 1854, p. 42. Observations on its advantages. RUSSELL (Rev. Michael), 1836.

Colleges of Arts and Manufactures for the better instruction of the industrial classes. LLOYD (J. A.), 1851.

Commercial. Bristol Diocesan Trade School. MOSELEY, etc., 1869.

Education Department: i. Expenditure; ii. Results of Inspection, 1879–88. PARLIAMENTARY..Papers, p. 476.

Engineers, Civil and Mechanical, Education of. DYER (H.), 1880, 1887; JENKIN, 1868.

—— Civil Engineer. GRAHAM-SMITH, 1876; HELE-SHAW, 1891.

EDUCATION—*continued.*

Engineers. Engineering Education in the British Dominions, 1891. INSTITUTION of C. E.; SOCIETY for the Promotion of Engineering Education, 1894.
—— Equipment of Engineering Schools. THURSTON (R. H.), 1893.
—— Engineers' Examinations of the Board of Trade Solutions to questions. DAVIES (E. J. M.), 1891.
—— Engineering Education at home and abroad. MITCHELL (E.), 1882.
—— Engineering Mechanical Schools, Efficiency of. WOLFF (A. R.), 1888.
Fine Arts, Teaching of. TRELAT (E.), 1864.
Higher Education, plea for making it accessible to all. ANGELL (J. B.), 1879.
Higher Polytechnic education, in Germany. KOŘISTKA, 1863.
Industrial Education. DUPIN, 1828, 1836.
—— on the Continent. GEOLOGICAL Survey, 1852; PLAYFAIR (L.), 1852.
—— Missing Link. HELE-SHAW, 1891.
—— Organisation of. MORIN and Tresca, 1863.
Lectures on Education. ROYAL Inst. of Gt. Britain, 1855.
Liberal Education with special reference to the leading studies of Cambridge. WHEWELL (W.), 1845.
Living Languages, Study of, for colloquial purposes. COTTON (Sir A.), 1875.
Manual Industry, relation to. MACARTHUR, 1884.
Mechanical Science, Prospectus of Sir J. Whitworth's Scholarships for. WHITWORTH (Sir J.), 1870, etc.
Minutes of Committee of Council, 1840–41. PARLIAMENTARY..Papers, p. 475.
National Education, Speech in the House of Commons on the Government plan for promoting. RUSSELL (Lord John), 1839.
—— Speech in the House of Lords on the Government plan. LANSDOWNE, 1839.
—— Reports of National Education Union, 1869, '70. NATIONAL Education Union.
National Schools of Science. Reports on. GILMAN (D. C.), 1872.
Natural Philosophy, Advantages of, and Astronomy as part of a general and professional education. LARDNER, 1829.
Naval Education, Report on Foreign Systems. SOLEY (J. R.), 1880.
New Education and the new Civilisation; their unity. THURSTON (R. H.), 1892, p. 310.
People, observations on the education of the. BROUGHAM, 1825.
Physics in Secondary Schools. SLATE (F.), 1892.
—— Apparatus for. MÜLLER (F. C. G.), 1889.

EDUCATION—*continued.*

Plea for Education as a public duty. LOTHROP, 1878.
Popular Education. FAIRBAIRN (Sir W.), 1860, pp. 403.
Present state and future Advancement.
SOPWITH (T.), 1853, p. 225.
Primary Education and the half-time system.
CHADWICK (Sir E.), 1887, p. 234.
—— and the receptivity of children.
CHADWICK (Sir E.), 1880, p. 234.
Recent measures for the promotion of Education, 1839.
PARLIAMENTARY..Papers, p. 475.
Reports of Royal Commission on Scientific Instruction and the Advancement of Science, 1872–75.
PARLIAMENTARY..Papers, p. 476.
Scientific Education. Report of Select Committee on Scientific Instruction, 1868. PARLIAMENTARY..Papers, p. 476.
—— Reports of the Committee of Council, England and Wales, 1879–88. PARLIAMENTARY..Papers, p. 476.
—— Study of abstract science. PLAYFAIR (L.), 1851.
—— Science and Art Department. Calendar, Directory, Examination Papers, Reports, etc.
SCIENCE and Art Dept., 1853, 1870–86.
—— Science Education Movement. ROBERTSON (G.), 1868.
—— Science Teaching. GUTHRIE (F.), 1886.
—— Scientific and Art Education in relation to Progress in manufactures. TYLOR (A.), 1863.
University study. SEDGWICK (A.), 1834.
Village Schools, Education in. SOPWITH (T.), 1868, p. 225.

Australia, Western, public elementary Education Bill. Report.
WESTERN Australia, 1871.
Bristol. Education Statistics.
STATISTICAL Society of Bristol, 1841; BRISTOL, 1841.
California. Educational Progress. KELLOGG, 1892.
France. Education of the Engineer. FLACHAT, 1868.
—— Report on general Education. JONES (Rev. H. L.), 1842.
Germany and Switzerland, Industrial Education in.
GERMANY, 1865.
Holland. HOLLAND, p. 65.
India, Madras. Department of Public Instruction. Report, 1859–60. INDIA, p. 122.
Ireland tranquillized. KENNEDY (J. P.), 1835.
New South Wales. Proposed College for the Training of Teachers of Public Schools. NEW SOUTH WALES, 1891, p. 401.
—— Report of the Council of Education on Public Schools, 1873–74. NEW SOUTH WALES, p. 401.

EDUCATION—*continued.*

New South Wales. Report of the Minister of Public Instruction, 1889. NEW SOUTH WALES, p. 401.

—— Scientific, Professional, and Technical Instruction. NEW SOUTH WALES, 1880, p. 401.

New York State. Report on School Hygiene, 1888. NEW York State.

Philadelphia. Public Schools Report, 1866. PHILADELPHIA, p. 34.

—— Exhibition, 1876, Education Department. PHILADELPHIA, 1877, p. 33.

Saxony, Elementary Education in. BASHFORD, 1881.

Scotland. Report on the Examination of its science and technical teaching. SCOTLAND, 1888, p. 174.

Spanish Public Education Annual, 1868. SPAIN, p. 234.

Toronto School of Practical Science. Prospectus, with Syllabus of the courses of instruction, etc. TORONTO, 1886, etc.

United Kingdom. Educational List and Directory of, for 1887–8. STEPHEN (W.). Add. 535.

United States Education. UNITED States, pp. 343–4.

Wisconsin Common Schools. Elementary Course of Study for. THAYER (J. B.), 1889.

EDUCATION (TECHNICAL). *See* TECHNICAL Instruction.

ELASTICITY OF SOLID BODIES, Laws of. RANKINE (W. J. M.), 1851, 1852; WEYRAUCH, 1884, '85. *See* STRENGTH OF MATERIALS.

ELECTRICITY (GENERAL REFERENCES). BECKET, 1773; BECQUEREL (A. C.), 1834; BEETZ, 1873; BIRD (G.), 1849; BOHNENBERGER, 1793–95; CAILLARD, 1891; CHAMORRO, 1870; COULOMB, 1785–89; DARY, 1883, 1892; DOVE, 1848; EXNER, 1888; FERGUSON (J.), 1770; FERGUSON (R. M.), 1876, '82; GUILLEMIN (A.), 1891; GUTHRIE (F.), 1880; JENKIN, 1878, '81; MASCART and Joubert, 1882, '83; MAYCOCK, 1891; MUNRO (J.), 1883, '90; PEPPER (J. H.), 1880; PLANTÉ, 1879; REESE, 1881.

Essays and Treatises. ADAMS, G. (1784), DESAGULIERS, 1742; HARRIS (Sir M. S.), 1857; KRIEG, 1888; MARTIN (B.), 1746; MURPHY (R.), 1833; PENROSE (F.), 1752; PRIESTLY, 1786; TURNER (R.), 1746. App. 578. VASCHY (A.), 1890; WILSON (B.), 1752. Lectures. FLEMING (J. A.), 1886; STURGEON (W.), 1842, 1852. Lessons. THOMPSON (S. P.), 1882; TYNDALL (J.), 1876 and '87, p. 335. Manuals. BURCH, 1893; CADIAT (E.), 1892; NOAD, 1855–57, '59. Researches. CAVENDISH, 1879. Thoughts on. CHALMERS (C.), 1851.

Amateurs, Electricity for. HOSPITALIER, 1885.

ELECTRICITY (GENERAL REFERENCES)—*continued.*

Amber-soul to Telephone, Electricity from. BENJAMIN, 1886.
American Electrical Directory for 1887–8.
PERIODICAL PUBLICATIONS, p. 9.
American Electrical Society. AMERICAN ELECT. SOC.
American Institute of Electrical Engineers.
AMERICAN INST. OF ELECT. ENG.
Annals of Electricity, Magnetism, etc.
PERIODICAL PUBLICATIONS, p. 11.
Annual of Electricity, 1884. REVEREND (A.)
Application to Domestic Purposes. PREECE, 1861.
—— Industry and Arts. Annual Account. DELAHAYE, 1885–91.
—— Military Purposes. WÄCHTER, 1883.
—— Modern Life. URBANITZKY (A.), 1886. Add. 537.
—— Practical Purposes. Lecture. SOLLY (E.), 1847.
—— Useful Arts, by Bain.
FINLAISON (J.), 1843; *also* App. 557.
Applications of. DU MONCEL, 1872–78; FERRINI, 1884; SCHŒNTJES (J.), 1886.
Applied to Agriculture, etc. SIEMENS (Sir W.), 1881, p. 198.
Board of Trade, Electricity at the. BLAKESLEY, 1883.
Cause of Electricity, and why some things are non-electricable.
FREKE, 1746.
—— with Remarks on Chemical Equivalents.
CARRUTHERS, 1886.
Century of Electricity. MENDENHALL, 1889.
Chemical Agencies of Electricity. DAVY (Sir H.), 1807.
Clock and Electrical Fire-brigade Telegraphy. JOBLER, 1883.
Diagrams (Electrical) and Connections.
DAVIS (C. H.) and Rae, 1876.
Dictionary. JACQUEZ, 1883. Dictionary of Electrical Words, Terms, and Phrases. HOUSTON, 1889, '92.
Electric Communication. WHITE (W.), 1850–1.
Electric Current: how Produced and how Used.
WALMSLEY (R. M.), 1894.
Electric Formulary. ZACH, 1883.
Electric Lines and Transmissions. General Treatise.
WEILLER (L.), and Vivarez, 1892.
Electric Waves. HERTZ, 1893.
Electrical Condition applied to Facts. COXWORTHY, 1848.
Electrical Deposition of Dust and Smoke. LODGE, 1886.
Electrical Directory. BERLY, 1889, etc.
Electrical Engineer. PERIODICAL PUBLICATIONS, p. 14.
Electrical Engineer. Aide-Mémoire. DUCHÉ, etc., 1888–89.
Constant Current. DESMOND, 1891.

ELECTRICITY (GENERAL REFERENCES)—*continued.*

Electrical Engineer's Pocket Book of Modern Rules, Formulas, Tables and Data. KEMPE (H. R.), 1890; MUNRO (J.) and Jamieson, 1884,'86, '89.

Electrical Engineers' Price-Book. GRIFFIN (C.) and Co., 1893.

Electrical Engineering. FISKE, 1883; POLYTECHNIC, 1886–87. Formulas. GEINITZ, Fleck and Hartig, 1865.

Electrical Experiments. FRANCIS (G.), 1848; HOADLY and WILSON, 1756

Electrical Installations. Rules for. VICTORIAN Engineers' Assoc., 1889.

Electrical Interferences and the Doctrine of G. A. Hirn. SCHWOERER (E.), 1891.

Electrical Magazine. PERIODICAL Publications, p. 14.

Electrical News and Telegraph Reporter. PERIODICAL PUBLICATIONS, p. 14.

Electrical Phenomena and Theories. Notes on a course of lectures. TYNDALL (J.), 1881, p. 335.

Electrical Review. PERIODICAL PUBLICATIONS, p. 14.

Electrical Science. BAKEWELL (F. C.), 1853.

Electrical World. PERIODICAL PUBLICATIONS, p. 14.

Electrician. PERIODICAL PUBLICATIONS, p. 14.

Electrician and Electrical Engineer. PERIODICAL PUBLICATIONS, p. 14.

Électricien. PERIODICAL PUBLICATIONS, p. 14.

Electrostatic, direct comparison of, with Electro-magnetic Force. MAXWELL, 1868.

Electro-technics. BISCAN, 1891; GERARD, 1886; STRECKER, 1888.

Elektrotechnische Zeitschrift. PERIODICAL PUBLICATIONS, p. 14.

Elettricità. PERIODICAL PUBLICATIONS, p. 14.

Exhibitions. *See* EXHIBITIONS (Electricity).

Experimental researches. FARADAY (M.), 1849.

Experiments and Observations. FRANKLIN (B.), 1769; RACKSTROW (B.), 1748. App. 572; WATSON (Sir William), 1746, pp. 407, 408.

Faraday's lines of Force. MAXWELL, 1856.

Fundamental Doctrines. HAUCK (W. P.), 1883.

Galvanism. Rudimentary treatise on Galvanism. HARRIS (Sir W. S.), 1856.

Handbook of Electro-technics. KITTLER, 1886–90.

High Frequency Discharges. Experiments with. SWINTON (A. A. C.), 1893.

History. HOPPE (E.), 1884.

Homes, Workshops, etc. WALKER (S. F.), '89, '90.

Industrial Electricity. CADIAT (E.), and Dubost, 1889; MONNIER, 1889.

ELECTRICITY (GENERAL REFERENCES)—*continued.*

Inquiry into the properties of. ANONYMOUS, 1746, p. 52.

Insulating (Transparent) Media, Refractive Index and Specific Inductive Capacity of. HOPKINSON (Dr. John), 1882, p. 74.

International Congress of Electricians. Comptes-rendus, Paris, 1881. INTERNATIONAL CONGRESS.

Leads, Electric. ZACHARIAS, 1883.

Laws of Electricity, Essays towards discovering the. ELLICOTT, 1748.

Leyden Discharges. Difference between, and Lightning Flashes, and their relative action on metallic bodies vicinal to the conductor of the respective discharges. WALKER (C. V.), 1842.

Leyden Jar residual charge. HOPKINSON (Dr. John).

Magnetism, Electricity and. ANGELL J., 1882; GORDON (J. E. H.), 1883; LARDNER, 1874; MAXWELL, 1873, '92; STEWART (Balfour) and Gee, 1885–87; THOMSON (Joseph J.), 1893; WORMELL (R.), 1882.

—— Dictionaries. DUMONT, Leblanc and La Bédoyère; LEFEVRE, 1890.

—— Absolute Measurements. GRAY (A.), 1888–93.

—— Action of Magnetism on a permanent Electric current. HOPKINSON (J.), 1880.

—— Electrostatics and Magnetism. THOMSON (Sir William), 1884.

Mathematical theory of Electricity. WATSON (H. W.) and Burbury, 1885.

Modern Applications. HOSPITALIER, 1881, '83; LODGE, 1889.

Municipal Electricity Works. HAMMOND (R.), 1893.

National Conference of Electricians. Proceedings, 1884–85. NATIONAL Conference.

Paris International Exhibition of Electricity, 1881. PARIS. Add. 525.

——, 1889. Electricity at. VIVAREZ (H.), 1890.

Patents in France from 1791. FOURNIER, 1881.

Phenomena. HAUKSBEE, 1709, '19. Deduced from the Æther of Sir I. Newton. WILSON (B.), 1746.

—— Electric ring-figures. RIESS (P. T.), 1861.

Pioneers of Electricity. MUNRO (J.), 1890.

Practical applications, 1883. INSTITUTION C. E.

Practical Electricity. AYRTON, 1887; CUTHBERTSON, 1821; GARIEL, 1884–86.

Practical treatise for use of engineers. LUCAS (F.), 1892.

Primers. HOUSTON, &c., 1887.

Production and applications of. BOULARD, 1882.

Progress of Electrical Science. BOULANGER, 1885. Recent progress. MOLERA, 1885.

Revue internationale de l'électricité. PERIODICAL PUBLICATIONS, p. 23.

ELECTRICITY (GENERAL REFERENCES)—*continued.*

Rudimentary Electricity. HARRIS (Sir W. S.), 1859.

Société Belge des Électriciens. Report, 1886–7. MOURLON.

Société Internationale des Électriciens. Bulletins. SOCIÉTÉ Internationale des Électriciens, 1886, etc.

Solar electric potential. SIEMENS (Werner von) 1883.

Solenoid. Diagrams showing the relation between the Length of, and the form of its Equipotential Surfaces. FARR (C. C.), 1894. Add. 500.

Student's Text Book. NOAD, 1867, '79.

Study of Electricity. WIEDEMANN (G.), 1882–85, '93.

Technology. FERRINI, 1879.

Terminology. French-English-German Vocabulary. FOURNIER, 1887.

Theory. CUMMING, 1885.

Theory and practice. CAVALLO (T.), 1777, 1795; CAVALLO (T.), 1782. App. 551; LA RIVE, 1853–58.

Theory of the Maintenance of Electric Currents by mechanical work. MAXWELL, 1867.

Theory, sources, and application. SPRAGUE (J. T.), 1875–1884, 1892.

Universal Electrical Directory and Advertiser. PERIODICAL PUBLICATIONS, p. 25.

ELECTRICITY (SPECIAL).

Animal Electricity, discoveries in. DU BOIS REYMOND, 1852.

Atmospheric Electricity. PHILLIPS (R.), 1863.

—— (Belgium). QUETELET, 1849.

Frictional Electricity. HARRIS (Sir W. S.), 1867; TREGLOHAN (T. P.), 1886.

—— Application of to the Purification of "Middlings." GRIMSHAW, 1882.

Machines, Electrical. BOHNENBERGER, 1784–91; RIESS, 1853, 1867–79.

—— Holtz and Töpler Machines. ATKINSON (P.), 1887.

—— Influence Machines. WIMSHURST, 1888.

Medical Electricity. Theory and practice of. CAVALLO (T.), 1781. App. 551.

—— Electricity in Surgery. BUCHANAN (Dr. G.), 1881.

—— Treatment of St. Vitus's dance by static electricity (danse de St. Guy). BECKENSTEINER, 1860.

Military Art, Electricity applied to. GUN (le Col.), 1889.

Mining operations, Electricity applied to. ROWAN (J. F.), 1887.

—— Suspension Transportation by Electricity. SPRAGUE Electric Rly., etc., 1888.

Search-light Projectors. BLONDEL, 1894; SAUTTER, Harlé & Co., 1894.

ELECTRICITY (SPECIAL)—*continued.*

Signals at night. CARVALHO, 1886.

Static Electricity. Elements. ATKINSON P., 1887.

Surveying. Electrical Instruments. WILKE, 1883.

Thermo-Electricity. HAUCK (W. P.), 1883, '89; ZANTEDESCHI, 1838. Electricity considered by the aid of Thermo-Electricity. RUST (A.), 1888.

Voltaic Electricity. Popular treatise. BACHHOFFNER, 1838.

Voltaic Electricity. Instructions for the multiplication of works of Art in Metal by Voltaic Electricity. SPENCER (T.), Carver and Guilder, 1840.

Welding, Electric. FODOR (Ede), 1892.

ELECTRICITY (ALTERNATE CURRENTS).

Alternating Current Machines, Paris Exhibition. ALLARD, etc., 1882.

Alternate Current Machine as a motor. Adams (W. G.), 1884.

Alternate Current Transformers, Design of. FLEMING (J. A.), 1889–93; WEEKES (R. W.), 1893.

Comparative Danger to Life of the Alternating and continuous Electrical Currents. BROWN (H. P.), 1889.

ELECTRICITY (BATTERIES).

Treatises. TOMMASI (D.), 1889; NIAUDET, 1884.

Batteries and their employment in telegraphy. SIVEWRIGHT (J.), 1875.

ELECTRICITY (BATTERIES, Primary).

Carbon Voltaic Battery. SILLIMAN (B.), 1843.

Electric piles. HAUCK (W. P.), 1889.

—— Theory and practice. CAZIN, 1881.

—— Thermo-electric pile. PELTIER, 1840?

Galvanic Batteries. HAUCK (W. P.), 1883.

Galvanic Coil, attraction of, on a small magnetic mass. AIRY (Sir G. B.), 1872, p. 16.

Galvanic Combinations formed by the arrangement of single metallic plates and fluids. DAVY (Sir H.), 1801.

Galvanic Properties of the principal Elementary Bodies with description of a new chemico-mechanical battery. SMEE (A.), 1840. App. 577.

Hellesen and E. C. C. Dry Battery Cells. Comparative tests of. JAMIESON, 1893, p. 154.

Obach and E. C. C. Types, Dry Cells of the. Report. JAMIESON (A.), 1894. Add. 512.

Ross Primary Battery. Ross (O. C. D.), 1886.

Ross Nitrate Battery. Ross (O. C. D.), 1889.

Stevens' Battery. STEVENS (E. A.), 1862.

Voltaic Battery. SOMZÉE (L.), 1881.

ELECTRICITY (BATTERIES, Secondary).

Accumulators. HAUCK (W. P.), 1883, '89; HOPPE (E.), 1888; SACK, 1892. Add. 532. Their management. SALOMONS (Sir D.), 1887, 1890, 1893–4.

Accumulators and Gas Motors. ACCUMULATOREN-Fabrik. Add. 479.

Electrical Accumulation and Conduction, Treatise on the Principles of. WEBB (F. C.), 1862.

Cantor Lectures on Secondary Batteries and the Electrical Storage of Energy. LODGE, 1883.

Faure Secondary Battery. ALLARD, etc., 1882; BUCHANAN (Dr. G.), 1881.

—— Instruction relating to the employment of the Faure batteries. REYNIER (E.), 1882.

Portable Secondary Batteries. NIBLETT, 1893.

Secondary Batteries, Modern apparatus for the storage of Electrical energy. NIBLETT, 1892.

Secondary Batteries, history. FERRARIS', Gaulard and Gibbs, 1885; GLASER de Cew, 1883; SIEMENS (Sir W.), 1881, p. 198.

Storage of Electrical Energy. PLANTÉ, 1887.

Voltaic Accumulator. REYNIER (E.), 1889.

ELECTRICITY (DYNAMOS).

Construction of Dynamo machines. CORSEPIUS, 1891.

Continuous Current Electric Machines. NIAUDET, 1881.

—— Paris Exhibition. ALLARD, etc., 1882.

Dynamos, Chemical Affinity, Electricity, and Magnetism, illustrated by a noiseless Dynamo requiring no steam power. ROSS (O. C. D.), 1891.

—— Compound Winding Dynamos. King Brown & Co. *v.* Anglo-Brush Corporation. VARLEY (S. A.), 1888.

—— Dynamo, its theory, design, and manufacture. HAWKINS (C. C.) and Wallis, 1893. Add. 506.

—— Dynamo Electricity. PRESCOTT, 1884.

—— Dynamo Machines. Theory. HOPKINSON (E.), 1887. Designing of continuous machines. JAMIESON (Andrew), 1889, '90; PICON, 1887, 1889.

—— Dynamos, chief features which regulate their application. BLACKBURN (A. B.), 1891.

—— Dynamos, Alternators, and Transformers. KAPP, 1893.

—— Direction for Winding Magnets for Dynamos. HERING (C.), 1887.

Dynamo-Electric Machine. CLAUSIUS, 1882, 1883, 1884; CLEMENCEAU, 1889; FRÖLICH, 1886. Principles. HERING (C.), 1888; HOPKINSON (J.), 1893; HOPKINSON (J. and E.), 1886.

—— System von Hefner-Alteneck and self-regulating Electric lamp. SIEMENS Brothers, 1876.

ELECTRICITY (DYNAMOS)—*continued.*

Electro-Dynamic Machinery. KENNELLY, 1893; THOMPSON (S. P.), 1883, '84, '86, '88, '92.

Great Brush Dynamo. THURSTON (R. H.), 1886, p. 309.

Magneto and Dynamo-Electric Machines. FAHIE, 1884; SCHELLEN (H.), 1879, 1884.

Magneto and Dynamo-Electric Machines. GLASER DE CEW, 1883, 1884, 1887.

Pyromagnetic Dynamo, a machine for producing electricity directly from Fuel. EDISON, 1887.

Work-measuring machines as applied to Dynamos. SMITH (F. J.), 1885.

ELECTRICITY (ELECTRIC LIGHT). CROMPTON, 1881. For industrial uses. CROMPTON, 1880; DU MONCEL, 1883; FONTAINE, 1877, '78, '79; FOURNIER, 1885; GORDON (J. E. H.), 1884; GRAETZ, 1883; HEDGES, 1879, '82; HOLMES, 1883, '87; HOPKINSON (J.), 1879, '80; JAMIN, 1878; MERLING, 1882–84; PRESCOTT, 1879; ROBINSON (Prof. H.), 1891; SCHILLING (N. H.), 1887; SHOOLBRED, (J. N.), 1878; STEPHEN (V.), 1885; URBANITZKY, 1883.

Central Station Electric Lighting. HEDGES, 1888.

—— Continental. HEDGES, 1892.

Central Stations. FORBES (G.), 1887.

Deaths from electrical lighting apparatus. BROWN (H. P.), 1889.

Distribution. Electric light cables and the distribution of Electricity. RUSSELL (S. A.), 1892.

Distributory Electrical Power Plants. Daft System. DAFT Electric Light Co., 1888.

Electric Illumination, with abstracts of specifications. DREDGE, 1882–5.

Electric Light Arithmetic. DAY (R. E.), 1882.

Electric Light Experiments. Report. SCHWENDLER (L.), 1878.

Electric Light: its production and use and Fittings, etc. URQUHART (J. W.), 1880, '90.

Electric Lighting Apparatus. BOSTON Manufacturers, 1882. Add. 486.

—— Generators, Distribution, etc. MONTILLOT, 1890.

—— Economic value of Electric Light and Power. FOOTE, 1889.

—— Electrical Engineering for Electric Light Artizans and Students. SLINGO (W.) and Brooker, 1890.

Electric Light Installations. SALOMONS (Sir D.), 1890, 1893–4. Rules. PHŒNIX Fire Office, 1888.

Electric Lighting Act, 1882. GLEN (W. C.) and A. GLEN; HIGGINS (C.) and Edwards; POLEY and Dethridge.

—— Amendment Bills, 1886; Amendment Act, 1888. PARLIAMENTARY..Papers, p. 476.

ELECTRICITY (ELECTRIC LIGHT)—*continued.*

Electric Lighting Acts, 1882. Applications to the Board of Trade under the Acts. PARLIAMENTARY..Papers, p. 476.

—— Law relating to. CUNYNGHAME, 1883; Acts 1882 and 1888. BOWER (G. S.) and Webb.

—— Report by the Board of Trade under Section 1 of the Electric Lighting Act, 1888. PARLIAMENTARY..Papers, p. 477.

—— Electric Lighting Orders Confirmation Bills, 1889. Memoranda. PARLIAMENTARY..Papers, p. 476.

Factories and Magazines for Explosives. Memorandum, 1891. PARLIAMENTARY..Papers, p. 476.

Fire Insurance Rules. HARTNELL (W.), 1890.

—— Prevention of Fire Risks, 1883. INSTITUTION of Elect. Eng.

—— Underwriters' Standard Requirements. MORTON (H.) and Anderson, 1882.

Gas. Electric Lighting *v.* Gas Lighting. Comparative Cost and Value. KIRKHAM and Hersey, 1878.

—— Electricity *v.* Gas Lighting. ANONYMOUS, 1877, p. 44; SCHILLING (N. H.), 1883; SUGG (W. T.), 1882; THWAITE (B. H.), 1883, p. 312.

—— Probable Influence on Gas interests. SPRAGUE (J. T.), 1878.

Gas Engine, Electric Lighting by. DELAHAYE, 1890.

History, production and use. ALGLAVE (E.), and Boulard, 1882.

Lumière électrique. PERIODICAL PUBLICATIONS, p. 18.

Mills, Electric Lighting in. WOODBURY (C. J. H.), 1883.

Municipal Authorities, Electric Lighting by. ROBINSON (Prof. H.), 1891.

—— Electric Lighting and its application to public illumination by municipal and other bodies, etc. SHOOLBRED (J. N.), 1879, 1882.

—— Supply by local authorities. HEDGES, 1883.

—— Town Councillor's Handbook. RUSSELL (N. S.), 1893.

New system. LACASSAGNE and Thiers, 1857.

Practical application. HIGGS (P.), 1879.

Precautions to be adopted. HEDGES, 1886.

Principles and Practice. SWINTON (A. A. C.), 1884.

Private electric light plants, with Priestman's Oil Engine. BISCOE, 1890.

Public Buildings. JAMIESON (Andrew), 1891.

Report of Select Committee, 1879. PARLIAMENTARY..Papers, p. 476.

Report of Select Committee on Electric Lighting Bill, 1882. PARLIAMENTARY..Papers, p. 476.

Report on its actual state. SCHILLING (N. H.), 1886

ELECTRICITY (ELECTRIC LIGHT)—*continued.*

Sanitary aspects of Electric Lighting. PREECE (W. H.), 1890.

Scientific Principles involved in Electric Lighting. Lectures. ADAMS (W. G.), 1881.

Ships. Electric Lighting for Marine Engineers: or, how to light a ship and keep the apparatus in order. WALKER (S. F.), 1892.

War, Electric Lighting in. NANSOUTY, 1888; WETTER (R. van), 1889.

Water Power, Electric Lighting by. GRIERSON (T. B.), 1883.

—— Electric Lighting of a Town. Project for the use of the power of a Waterfall. VIGREUX (L.), 1889.

Westinghouse alternating current Electric Lighting Plant. Test of efficiency and the Alternating system. WESTINGHOUSE Electric Co., 1888, '90.

Australia, Europe, and America, etc., Report on public and other Electric Lighting in. ANDERSON (G.), 1894. Add. 480.

Bradford Corporation Electric Supply. SHOOLBRED (J. N.), 1892, 1893, 1894.

Calcutta, Electric Light at the East India Company's Station at. Report. SCHWENDLER (L.), 1881.

Ealing Electric Lighting: description of the undertaking. EALING, 1894. Add. 498.

Frankfort-on-Main. FERRARIS and others, 1889.

Glasgow. Kelvinside Electric Lighting. KELVINSIDE, Glasgow, 1893. Add. 513.

—— St. Enoch Station, G. and S. W. Rly. Terminus, Electric Lighting of. BRITISH Electric Light Co. Add. 488.

Leeds. Report, 1889. LEEDS, p. 225.

Liverpool. Reports, 1878, 1892. LIVERPOOL, p. 246.

London. Failures in the streets. HAYWOOD (W.), 1893, p. 31.

—— Methods in use in. KENNEDY (A. B. W.), 1891.

—— Reports. HAYWOOD (W.), 1878, '82, '83, '85, pp. 30–31.

—— Report by Major Marindin, 1888. LONDON, p. 257.

—— The three Bridges and various thoroughfares. HAYWOOD (W.), 1880, p. 31.

—— Chelsea Vestry Electric Light. Reports. STAYTON (G. H.), 1878, 1882.

—— Holborn Viaduct. Report. HAYWOOD (W.), 1879, p. 31.

—— St. Pancras Electric Lighting. Regent's Park Station described. ST. PANCRAS, 1892.

—— Experiments with the Electric Light on the Victoria Embankment. Report, 1879. LONDON, p. 257.

Rochester, N.Y., Electric Station of the Citizens Light and Power Co. of. CARTWRIGHT (R.), 1894. Add. 491.

ELECTRICITY (ELECTRIC LIGHT)—*continued.*

Scarborough Electric Lighting, Description of the plant. SCARBOROUGH, 1894. Add. 532;

United States. HAGEN (E.), 1885.

Vienna. PICHLER, 1887. Electric Central Station of the Imp. Cont. Gas Association. EHRENDORFER and Melhuish, 1889.

Westgate-on-Sea, the Jablochkoff system. BENNETT (W. H.) and Valon.

Yarmouth (Great). Information from various cities and towns. COCKBILL, 1891.

ELECTRICITY (ELECTRIC LIGHT, *Arc-Lamps*).

Arc and Glow Lamps. MAIER, 1886.

Brush System. BRUSH (C. T.), 1879.

Candles, Electric. Paris Exhibition. ALLARD, etc., 1882.

Carbons, fluted craterless, for Arc Lighting. DOUGLASS (Sir J. N.), 1886.

ELECTRICITY (GLOW LAMPS). MAIER, 1886; RAM, 1893; SAWYER (W. E.), 1881. Paris Exhibit. ALLARD, etc., 1882.

—— Edison's Lamps. DU MONCEL and Preece, 1882.

—— Swan's electric light. BUCHANAN (Dr. G.), 1881.

ELECTRICITY (INDUCTION). DOVE, 1843.

Inductance and its proposed unit, the Henry. KENNELLY, 1890.

Induction and Conduction. SMITH (Willoughby), 1885.

Induction through Air and Water at great distances without the use of Parallel Wires. STEVENSON (C. A.), 1893.

Induction Machines. BOULANGER, 1885.

Static Electric Induction. GORDON (J. E. H.), 1879.

Telegraphic Communication by Induction, by means of Coils. STEVENSON (C. A.), 1894.

Volta and Magneto-Electric Induction. SMITH (Willoughby), 1884.

ELECTRICITY (MOTORS).

Electricity as a motive power. DU MONCEL and Geraldy, 1883.

Electric Motor and its applications. MARTIN (T. C.) and Wetzler, 1887; URQUHART (J. W.), 1882.

Electric Motors and their application to Electric Traction. KAPP, 1891.

—— Continuous Current. LEBLOND, 1893.

—— Waller-Manville System of Electric Traction. WALLER (J. E.) and Manville, 1891.

—— Work-measuring machines as applied to Electro-motors. SMITH (F. J.) 1885.

ELECTRICITY (SUPPLY, ETC.).

Central Station management and finance. FOSTER (H. A.), 1891.

Comparisons between the different systems of distributing Electricity. ROBINSON (Prof. H.), 1893.

ELECTRICITY (SUPPLY, ETC.)—*continued.*

Construction of Central Stations. WOODBURY (C. J. H.), 1890.

Distribution of Electricity. FORBES (G.), 1885; PICOU, 1892. Tomlinson's Patents. GORDON (J. E. H.), 1890.

Domestic Electric Lighting. SEGUNDO (E. C. de), 1892; VALETTE (H.).

—— Electrical Supplies. WOODHOUSE and Rawson, 1888.

—— Light in our Homes. HAMMOND, R., 1884; HOSPITALIER, 1885, '87; JUPPONT and Fournier, 1889.

—— In the house. LEFEVRE, 1889.

Electrical Distribution of heat, light and power. BROWN (H. P.), 1889.

Electric or Telegraphic Conductors, Improvements in. NEWTON (W. E.), 1864.

France. Central Stations. FRANCE, 1894, p. 436.

Generation and distribution from central stations. KRIEG, 1888.

Regulators in distribution. MARIÉ, 1888.

Relation between strength of an Electric Current and the diameter of Conductors to prevent overheating. FORBES (G.), 1884.

Table of the relative weights and sizes of insulated copper conductors. WELCH (E. J. C.), 1884.

ELECTRICITY (TESTING AND MEASUREMENT).

Electrical Measurement. CLARK (L.), 1868, 1872, 1874; FOSTER (C.), 1879. Lectures. JENKIN (F.), 1867. Add. 512.

Electrical Measurement. Arithmetic of Electrical Measurements. HOBBS (W. R. P.), 1887.

—— Measure in absolute units. BLAVIER, 1881.

—— Practical Electrical Measurement. SWINBURNE (J.), 1888.

Electrical and Magnetic Measurement. DAY (R. E.), 1876, 1885.

Electrical Standardizing, Testing and Training Institution. Prospectus. Training of Electrical Engineers. ELECTRICAL Standardizing Inst., 1890, '93.

—— Reports of Committee on Electrical Standards. JENKIN, 1873.

Electrical Testing, Handbook. KEMPE, 1876, '87, '92.

Electrical Units popularly explained. SWINBURNE (J.), 1883.

—— Unit of Electrical resistance. SIEMENS (W. von), 1866.

Electrometers. BOTTOMLEY, 1878.

—— Industrial Electrometry. PICOU, 1882.

—— Quadrant Electrometer. HOPKINSON (J.), 1885, p. 74.

—— Method of determining the value of rapid variations of a difference of potential by means of the Capillary Electrometer. BURCH, 1890.

—— Time relations of the Excursions of the Capillary Electrometer. BURCH, 1892.

ELECTRICITY (TESTING AND MEASUREMENT)—*continued.*

Galvanometer and its uses. HASKINS (C. H.), 1884.

—— Electrical Measurement and the Galvanometer. LOCKWOOD (J. D.), 1883.

Measurement of electrical and magnetic quantities. CLAUSIUS, 1882.

Resistance-Measurer. SIEMENS (Sir W.), 1867, p. 198.

ELECTRICITY (TRANSMISSION OF POWER).

Electric Power Installations, Rules. PHŒNIX Fire Office, 1888.

Electrical Power Storage Company. Public Supply of Electricity. ELECTRICAL Power, 1888, '89.

Production and sale of Electrical Energy by central stations. WITZ (A.), 1889.

Transmission of power to a distance. ATKINSON (P.), 1894; BERINGER, 1883; BOULANGER, 1887; BRAUN (F.), 1892; GRAETZ, 1883; HIGGS (P.), 1879; HILLAIRET, 1884; JAPING, 1883, '85; LUCE, 1886; SIEMENS (A.) and Hopkinson, 1883; TRESCA, 1883; WOODBURY (C. J. H.), 1893.

—— Factories. SIEMENS (A.), 1893.

—— Mining Operations. SNELL (A. T.), 1889.

—— For Mining Work. SPRAGUE Electric Rly. and Motor Co. 1888.

—— Continuous Train. HENARD, 1887.

—— Geometrical determination of the conditions of maximum efficiency in the case of transmission of power by means of alternating electric current. BLAKESLEY, 1888.

—— Electric Transmission of Energy and its transformation, sub-division and distribution. KAPP, 1886, '91; KAPP (G.), 1894. Add. 313.

—— Electrical distribution of energy over extended areas in mines. SNELL (A. T.), 1890.

Creil, Experiments at. LAURIOL, 1886.

Niagara Falls. FORBES (G.), 1893.

Rochester, N.Y., Electric Station of the Citizens Light and Power Co. of. CARTWRIGHT (R.), 1894. Add. 491.

Tivoli to Rome, transmission of electrical energy from. BANTI, 1893.

ELECTRICITY (VARIOUS ELECTRICAL APPLIANCES).

Unnoticed danger in certain apparatus for distribution of Electricity. HOPKINSON (J.), 1885, p. 74.

Use of certain Electrical Apparatus. ANONYMOUS (1875), p. 55.

ELECTRICITY (ELECTRO-CHEMISTRY).

Electricity and Electro-Chemistry. SINGER (G. J.), 1814.

Inorganic. GORE (G.), 1888.

ELECTRICITY (ELECTRO-DYNAMICS).

Theory. MATHIEU, 1888; WEBER (Wilhelm), 1892–94.

ELECTRICITY (ELECTRO-MAGNETISM).
Comparison of the Electric circuit and the Magnetic circuit. NOBILI, 1838.
Connection with Telegraphy. DUB, 1863.
Electricity and Magnetism, unity of. CLAUSIUS, 1882.
Electro-magnet and Electro-magnetic Mechanism. THOMPSON (S. P.), 1892.
—— Construction of Electro-magnets. DU MONCEL, 1882, '83.
Lifting power. ROBINSON (T. R.), 1852–59.
Electro-magnetic Field, Dynamical Theory. MAXWELL, 1865.
—— Machine Tools. ROWAN (F. J.), 1887.
—— Motive Machines. WATKINS (F.), 1838.
—— Practical system of units. SIEMENS (Sir W.), 1882, p. 198.
—— Telegraph Handbook. LORING, 1878.
Electro-magnetism, Popular treatise. BACHHOFFNER, 1838; DUB, 1861.
—— Scientific Researches. STURGEON (W.), 1852.
—— And the construction of Dynamos. JACKSON (D. C.), 1893.
—— Or Electro-dynamics, Popular Sketch of. WATKINS (F.), 1828.
—— Therapeutic application of, in the treatment of Rheumatic and Paralytic Affections. FRORIEP, 1850.
—— Motions of the Earth and Heavenly Bodies as explained by electro-magnetic attraction and repulsion. CUNNINGHAM (P.), 1834.
—— "Currie" long pull Electro-magnet. TIMMIS (I. A.), 1886.

ELECTRICITY (ELECTRO-METALLURGY). BALLING, 1888; BORCHERS, 1891; GORE (G.), 1877; GRAETZ, 1883; SMEE (A.), 1841. App. 377; WATT (A.), 1860.
—— Application of, to the arts. ELKINGTON and Co., 1844.
—— Elements, or the art of working in metals by the galvanic fluid. SMEE (A.), 1841.
—— History. DIRCKS, 1863.
—— Manual. NAPIER (J.), 1860.

ELECTRICITY (ELECTROLYSIS). JAHN (H.), 1883; JAPING, 1883, '85.
Electro-Deposition: a practical treatise on the electrolysis of gold, silver, copper, etc. WATT (A.), 1886.
Metallic resistance and chemical reaction. MARCHESE, 1884.
Prevention of Electrolysis of Water Pipes. GOODELL, 1894.
Refining of metals and treatment of ores by means of electricity. FONTAINE, 1885, '92.
Sulphur and metallic salts, mechanical work consumed in their electrolisation. MARCHESE, 1884.

ELECTRICITY (ELECTRO-MOTIVE FORCE).
Generation of Electro-motive force in the coalfields, and its application to industrial centres. THWAITE (B. H.), 1893, p. 312.
Seat of electromotive forces in a voltaic cell. HOPKINSON (J.), 1885.
Treatment of electro-motive force between linear currents and conductors. CLAUSIUS, 1876.

ELECTRO-BIOLOGY. Elements. SMEE (A.), 1849.

ELECTRO-PLATING. URQUHART (J. W.), 1882, 1894.
Galvanoplastic Manipulations: a guide for the gold and silver Electroplater. ROSELEUR (A.), 1872.
Practical Guide for Gold and Silver Electroplater. WAHL (W.), 1883.

ELEPHANTS. Transport by railway. CLARKE (H. W.), 1879.

ELLIPSE.
Elements of the Ellipse. ADAMS (J.), 1818.
Elliptical movements. New calculations. SANG (E.), 1879.

EMBANKING.
Determination of surface. Cuttings and embankments. LALANNE, 1850.
Draining and consolidation. BRUÈRE, 1858.
Embanking Lands from the Sea. WIGGINS (J.), 1852, '67.
Embankments for retaining Water. MARSH (J. T.), 1865.
Methods of Calculating the Cubic Contents of Embankments by the aid of Diagrams. TRAUTWINE (J. C.), 1887.
Tables for calculating the cubic contents of Excavations and Embankments. HUDSON (J. R.), 1886.

India. Damoodah Embankments, Bengal, 1856–58. INDIA, p. 110.
—— Hidgelee Province Embankments. Report, 1861. INDIA, p. 119.
Mississippi. Principles and practice of embanking Lands from river-floods as applied to "levees" of the. HEWSON (W.), 1860.
Orissa Embankments. Report. TAYLOR (WILLIAM C.), 1872.
Scheldt (East). HAGEN, 1867.
Thames Embankment, Reports, Acts, Bills, Specifications, Contracts, etc. THAMES River, pp. 292–294.
—— Embankment between Blackfriars and Westminster Bridges. A letter. WOOD (Thomas L.), 1859
—— Proposed Isolated Embankment with side canal and marginal low-level intercepting sewer. WALMSLEY (E. B.), 1865.

EMBROIDERY. Art. COLE (A. S.), 1886.

EMIGRATION.

Emigration to the British Colonies. BATE, 1862.
London National Benevolent Emigration Fund. Correspondence, 1850. NATIONAL Benevolent.
National Colonial Emigration Society. Report, 1863. NATIONAL Colonial.
National importance of Emigration. BAGOT (C. H.), 1863.
Sidney's Emigrant's Journal. PERIODICAL PUBLICATIONS, p. 25.

America (North), Emigration to. NELSON (J.), 1869.
Argentine Republic as a field for European Emigration. LATZINA, 1883.
Australia. Lancashire Distress and Emigration to Australia. LANCASTER, 1863.
Canada, advantages of Emigration to. CATTERMOLE, 1831.
—— Successful Emigration to. TANNER (H.), 1884.
European. HEURTIER, 1854.
India. Madras. Report of the Protector of Emigrants, 1859–60. INDIA, p. 122.
New Zealand. Immigration, 1871–72. NEW ZEALAND, p. 410.
United States. Special Reports on Immigration. YOUNG (E.), 1872.

EMPLOYERS' LIABILITY. Report of Select Committee, 1877. PARLIAMENTARY..Papers, p. 477.

EMPLOYMENT. Chief cause of our want of it, with remedy. STANDFIELD (J.), 1880.

ENCYCLOPÆDIAS. *See* DICTIONARIES.

ENERGY. *See* POWER.

ENGINEERING.

Aid to Engineering Solution. JACKSON (L. d'A.), 1885.
Aid-book to Engineering Enterprise abroad. MATHESON, 1878–81, '89.
Aide-mémoire de l'ingénieur. HUGUENIN, 1887.
Annales du génie civil. PERIODICAL PUBLICATIONS, p. 10.
Annual Retrospect. BURNELL, 1862.
Archiv für die Artillerie- und Ingenieur-Offiziere, etc. PERIODICAL PUBLICATIONS, p. 11.
Art of the Engineer. BIROT, 1869, '83.
Building News and Engineering Journal. PERIODICAL PUBLICATIONS, p. 12.
Cadet Engineer, or Steam for the Student. LONG (J. H.) and Buel, 1865.

ENGINEERING—*continued.*

Civil Engineer and Architect. PERIODICAL PUBLICATIONS, p. 13.

Civil Engineering. CLEGG (S.) jun., 1849; HOSKING, 1841. Elementary Course, 1860. RANKINE (W. J. M.), 1863,' 73. Treatise, 1875. MAHAN.

—— Elements. MILLINGTON, 1843; SCOTT (M.), 1874, p. 176; WHEELER (J. B.), 1884.

Civil Engineer, Function of, in the Work of Colonisation. DOBSON, 1887. Future prospects of the profession. DAWSON (C. J. C.), 1870.

Civil Engineers' Pocket Book. TRAUTWINE (J. C.), 1872, 1888–94.

Civil Engineers' and Contractors' Estimate and Price Book. ATCHLEY, 1867.

Civilingenieur. PERIODICAL PUBLICATIONS, p. 13.

Civil and Mechanical Engineering. HALDANE, 1887, '90. SMITH (William), Noble and Smith, 1877. MS. Letters on, TREDGOLD (T.)

Collegio degl' Ingeneri ed Architetti. NAPLES. Add. 522.

Colonial Engineers, Information for. Pt. 1, Ceylon; pt. 2, Southern Africa; pt. 3, India. SPON (E. & F. N.), 1875–77.

Dictionary of Engineering. APPLETON (D.), 1857.

—— Spons' dictionary. BYRNE (O.), 1869–81.

—— Civil and Mechanical Engineering. Dictionary of terms used in. WEALE (J.), 1849–50, 1875.

Encyclopædia of Civil Engineering. CRESY, 1847.

Engineer. PERIODICAL PUBLICATIONS, p. 15.

—— Who is he and what has he done? HAUPT (L. M.), 1885.

—— Engineer of the Future. BARR (A.), 1888.

Engineer and Machinist. PERIODICAL PUBLICATIONS, p. 15.

Engineer and Machinist's Assistant. ANONYMOUS, 1853, p. 44.

Engineer and Machinist's Drawing Book. ANONYMOUS, 1853, p. 44.

Engineers' Club Papers. PHILADELPHIA, 1878, p. 33.

Engineers' Companion and Pocket Table Book. SCRIBNER (J. M.), 1878.

Engineers' Compendium. SEARS (J. E.), 1888–90.

Engineers' Field Book. CROSS (C. S.), 1890.

Engineers' Handbook. LOWNDES (C. S.), 1860.

Engineers' Handbook to the Local Marine Board Examinations. AINSLEY, 1868, 1886; REED (T.), 1879; THORN (W. H.), 1885.

Engineers' Handy Book. ROPER (S.), 1881.

Engineers' Holiday. PIDGEON, 1882.

Engineers' Journal. PERIODICAL PUBLICATIONS, p. 15.

Engineers' Pocket Book. ADCOCK (T.), 1861–88.

ENGINEERING—*continued.*

Engineers' Pocket Book for 1862–3, 1867–1880.
ANONYMOUS. Add. 481.

Engineers' Price Books, Diary and Reference Books, etc.
SPON (E. and F. N.), 1876–92

Engineers' Year-Book of formulæ, rules, tables, data and memoranda. KEMPE (H. R.), 1894.

Engineers and Officials. ANONYMOUS, 1856, p. 45.

Engineering. PERIODICAL PUBLICATIONS, p. 15.

Engineering and Mining Journal. PERIODICAL PUBLICATIONS, p. 15.

Engineering as a Learned Profession.
THURSTON (R. H.), 1894, p. 309.

Engineering during the last half century.
VERNON-HARCOURT (L. F.), 1891.

Engineering Calculations. Calculating Series. GANGA Ram, 1884.

Engineering Club. Rio de Janeiro.

Engineering Construction. PHIPPS, 1874

—— Pattern Making. ANONYMOUS, 1885, p. 51

—— Construction in Iron, Steel and Timber.
WARREN (W. H.), 1894

Engineering Drawing. CLARKE (G. S.), 1884; Workman's Manual. MAXTON, 1886.

Engineering Estimates, Cost and Accounts.
ANONYMOUS, 1890, p. 44.

Engineering Exchange, London. BOLTON (R.), 1892.

Engineering Facts and Figures. PERIODICAL PUBLICATIONS, p. 15.

Engineering Field Work. BRUFF (P.), 1840.

Engineering Literature, Index.
ASSOCIATION of Engineering Societies.

Engineering News. PERIODICAL PUBLICATIONS, p. 15.

Engineering notes. ROBERTSON (F.), 1873.

Engineering Plagiarist, or Dodd from Phillips exposed.
ANONYMOUS, 1795, p. 45.

Engineering Science handbook. BECKER (M.), 1857–61.

Engineering and Architecture. The line of demarkation between.
WILSON (Joseph M.), 1887.

Engineering and Engineers. MARTINDALE, 1871.

Foreman Engineer and Draughtsman.
PERIODICAL PUBLICATIONS, p. 15.

Formularies for the Engineer. ARMENGAUD, 1881.

General and alphabetical handbook. RICHARD (G. T.), 1848–54.

Génie civil. PERIODICAL PUBLICATIONS, p. 15.

Génie industriel. PERIODICAL PUBLICATIONS, p. 15.

Giornale del genio civile. PERIODICAL PUBLICATIONS, p. 16.

Glossary. BREES, 1841, 1853.

ENGINEERING—*continued.*

Graphic tables. LALANNE, 1846, 1879.

High School for Mathematics and Engineering Prospectus, 1841. HIGH School.

Hints to young Engineers. WILSON (Joseph W.), 1874.

Ingegneria civile e le arti industriali. PERIODICAL PUBLICATIONS, p. 16.

Ingener [Russian]. PERIODICAL PUBLICATIONS, p. 16.

Ingénieur: Journal scientifique. PERIODICAL PUBLICATIONS, p. 17.

Ingenieur: Zeitschrift. PERIODICAL PUBLICATIONS, p. 16.

Ingenieur Kalender. FEHLAND, 1882, etc.

Ingenieurs Taschenbuch. ANONYMOUS, 1887, 1892, p. 47.

Machinery and Appliances used in Engineering Works. HILL (W.), 1886.

Manuel de l'ingénieur. COLOMBO, 1882.

Materials of Engineering. THURSTON (R. H.), 1883, p. 310.

Mechanical Engineering. ADAMS (H.), 1883; CAMPIN, 1863; FAIRBAIRN (Sir W.), 1860, p. 403; IMRAY and Biggs; LINEHAM (W. J.), 1894. Add. 515.

—— Complete course of Mechanical Engineering drawing. ARMENGAUD (J. E.), 1853.

—— Developments of, during the last half century. BRAMWELL (Sir F. J.), 1882, p. 169.

—— Graphics applied to. SMITH (Robert H.), 1889.

Mechanical Engineering Materials, properties and treatment in construction. MARKS (E. C. R.), 1893.

Mechanical Engineering Students, Advice to. PERRY (Prof. J.), 1888, p. 29.

Mechanical Engineers, Handbook for. ADAMS (H.), 1891–93.

—— Office Book. FOLEY, 1881. Reference Book, FOLEY, 1891.

—— Rules, tables and data for Mechanical Engineers. CLARK (D. K.), 1877.

Mechanical Principles. MOSELEY, 1843, '55.

Mechanic's, machinist's and engineer's book of reference. HASLETT, 1871.

Mechanics of Engineering. CHURCH (J. P.), 1888; WHEWELL (W.), 1841.

Mechanics' Own Book. SPON (E. and F. N.), 1886.

Military Engineering, elementary course. MAHAN, 1867.

—— Text book of. WHEELER (J. B.), 1884.

Models, need of, and drawings to accompany communications relative to the construction and details of Engineering Works. GRAINGER (T.), 1849.

Modern Engineering. McALPINE, 1874; Record of its progress, 1863–66. HUMBER.

ENGINEERING—*continued.*

Modern Mechanical Engineering and Machine Making. BURN (R. S.), 1888.

Municipal Engineering BOULNOIS, 1891.

Municipal and Sanitary Engineers' Handbook. BOULNOIS, 1888, 1892.

Notes and formulæ of the Engineer and the Constructor Mechanician. LAHARPE, 1893.

Outside the class-room: thoughts for young engineers. BAILEY (W. H.), 1891.

Papers on Engineering. WEALE (J.), 1843–49.

Paris Exhibition of 1878. Engineering at. MORISON (G. S.), North, and Bogart, 1878.

Past Progress and Present Results in some branches. POWRIE, 1888.

Pioneer Engineering: Operations connected with the settlement of waste lands in new countries. DOBSON, 1877.

Pocketbook. NYSTROM, 1870.

Pocketbook of Engineering. GANGA Ram, 1888. Add. 502.

Pocketbook of useful Formulæ and Memoranda for Civil and Mechanical Engineers. MOLESWORTH, 1863, '71, '76, '79, '90, '93.

Politecnico. Giornale dell' ingegneri, architetti civili ed industriali. PERIODICAL PUBLICATIONS, p. 21.

Ponts et Chaussées, École des. FRANCE, 1834, '70, p. 435; GŒURY, 1806–7; LESAGE, 1810; SAINT VENANT (A. J. C. B. de), 1838. Works. COURTIN, 1812.

—— Annales des Conducteurs des Ponts et Chaussées. PERIODICAL PUBLICATIONS, p. 10.

—— Annales des Ponts et Chaussées. PERIODICAL PUBLICATIONS, p. 10.

—— Annuaire du Corps Royale des Ponts et Chaussées, etc. PERIODICAL PUBLICATIONS, p. 11.

—— Canals, Suspension Bridges, Dams, etc. CORDIER, 1823–28.

—— Catalogues 1872, '73, '81, '86. Collection of designs, 1820, 1857, etc. Decrets, 1867. Laboratories, 1891. Lectures, 1847, etc. Notes, 1844, etc. Programmes, etc. PARIS, pp. 453–54.

—— Conditions imposed on Contractors. CHATIGNIER, 1857.

—— Course of construction, with applications drawn from the art of the engineers of the "Ponts et Chaussées." SGANZIN, 1839–41.

—— Dictionary. EXCHAQUET, 1787.

—— Hainaut. HAINAUT, 1879.

—— Laws, etc. POTERLET, 1820.

—— Manual, 1871–78. Materials of Construction, 1885. DEBAUVE.

ENGINEERING—*continued.*

Ponts et Chaussées, École des. Manuel du Conducteur. ENDRES, 1857.

—— France and England. DUPIN, 1818, '20.

—— Mode of recruiting for the Corps des ponts et chaussées. SOCIÉTÉ des Ingénieurs Civils, 1848.

—— Models, charts, etc., relating to the works of the "Ponts et Chaussées" and mines. PHILADELPHIA (1876), p. 33.

Practical Engineer's Handbook. HUTTON (W. S.), 1887.

"Practical Engineer" Pocket Book and Diary. ANONYMOUS, 1891, etc., p. 52.

Principles and practice of Civil Engineering. CONYBEARE, 1857–59.

Railroad and Engineering Journal. PERIODICAL PUBLICATIONS, p. 22.

Rivista di Artiglieria e genio. PERIODICAL PUBLICATIONS, p. 24.

Road book for Engineers. EYTH, 1871.

Romance of Engineering. FRITH, 1892.

Royal Engineer. HEAD (Sir F. B.), 1869.

—— Aide-Mémoire for the use of officers. Formulæ, tables, etc. COOKE (A. C.), 1876–83.

—— Department: its work and estimates. ROYAL Engineers, 1862.

—— Field Operations at Kassassin and the lines of Tel-el-Kebir. ROYAL Engineers, 1882.

—— Field service Pocketbook. SCOTT-MONCRIEFF (Major G. K.), 1894.

—— History of the Corps. PORTER (W.), 1889.

—— Royal Engineers Journal. PERIODICAL PUBLICATIONS, p. 24.

—— Operations conducted by the Corps of the Royal Engineers. From the invasion of the Crimea to the fall of Sebastopol. ROYAL Engineers, 1859.

—— Professional Papers and others relating to the Corps. ROYAL Engineers, 1837–77, 1893.

—— Report on employment of Royal Engineers in civil departments of the State. ROYAL Engineers, 1871.

Rudiments of Civil Engineering. LAW (H.), 1850, '54, '62, '81.

Sanitary. *See* SANITATION.

Sappers and Miners. Handbook for officers. PASTEUR (J. D.), 1837–38.

Scales. System and List of Scales of equal parts applicable to Engineering. HOLTZAPFFEL (C.), 1838; HOLTZAPFFEL (C.), 1838. App. 562.

Science and Art of the Engineer. COLLIGNON (E.), 1892.

Science of the Engineer. CLAUDEL, 1857.

Specifications and Contracts. HAUPT (L. M.), 1878.

ENGINEERING—*continued.*

Specifications of Works (Civil and Mechanical Engineering). BLENKARN, 1865.
Study. KNIGHT (Cameron), 1869.
Study and practice. FIDLER, 1891.
Stummer's Ingenieur. PERIODICAL PUBLICATIONS, p. 25.
Surveyor, Engineer, and Architect. PERIODICAL PUBLICATIONS, p. 25.
Tables, formulas, etc. CANTALUPI, 1852; LACROIX (E.), 1869–88.
Theory. GROSHOF, 1879–90.
Theory and practice of the art of the engineer and of the constructor of machines, etc. VIGREUX (L.), 1887.
Useful Information for Engineers. FAIRBAIRN (Sir W.), 1856–66, p. 403.
Van Nostrand's Eclectic Engineering Magazine. PERIODICAL PUBLICATIONS, p. 26.
Works Manager's Handbook. HUTTON (W. S.), 1855, '90.
Workshop manipulation. Its Economy. RICHARDS (J.), 1876.
Workshop Receipts. SPON (E. and F. N.), 1873–92.
Workshops. Establishment at Creusot. CREUSOT, 1828.
—— Chevalier (V.), aîné. Inventions. CHEVALIER, 1824. App. 551.
—— Establishment of John Cockerill at Seraing. LECOCQ, 1854.
—— Workshops of M. Hallette. SÉGUIER (A. P.), 1846.
Young Engineer's Own Book. ROPER (S.), 1884.

America, North, Civil Engineering of. STEVENSON (D.), 1838, '59.
Argentine Republic. ARGENTINE.
Australia, South, Engineering Department. Return of Employés. SOUTH Australia, 1867, p. 227.
Bayerischer Architekten- und Ingenieur-Verein. BAYERISCHER, 1874–77.
Bristol, Engineer's views on the government of. BRISTOL, 1893.
British Engineers, Considerations on the Establishment of; BRUCE (R. G.), 1768. Future of. PRELLER, 1893.
—— Engineering Notes from England. TRAUTWINE (J. C.), junior, 1889.
—— Civil and Mechanical Engineering in Lancashire and Cheshire. FAIRBAIRN (Sir W.), 1869, p. 403.
—— Scotland, Marine, Hydraulic, and Sanitary Engineering in. ROBERTSON (G.), 1867.
Cape Colony. Report of the Colonial Engineer for 1863. CAPE Colony, 1864, p. 221
Germany. Deutsche Bauzeitung. PERIODICAL PUBLICATIONS, p. 13.
India. CUNNINGHAM (A.), 1871–8; DANVERS, 1868. Examination Papers, 1851–68, 1859–69. INDIA, pp. 100, 101.

ENGINEERING—*continued.*

India. Excess of supply. Civil Engineers, 1878. INDIA, p. 101.
—— Executive Engineers in the Sind Province. Reports, 1855–7, 1857–8. INDIA, p. 131.
—— Grievances in the Public Works Department, 1869, '77, '86, '88, '90. INDIA, pp. 100, 101.
—— Indian Engineer. PERIODICAL PUBLICATIONS, p. 16.
—— Indian Engineering. PERIODICAL PUBLICATIONS, p. 16.
—— Indian Engineering, Professional Papers on. THOMASON Civil Engineering Coll., 1864–86.
—— Bombay Engineers. Reports, 1846, etc. INDIA, p. 111.
—— Madras Presidency Corps of Engineers. Reports, papers, etc., on professional subjects connected with their duties. INDIA, 1839–59. Add. 510.
—— Roorkee Treatise on Civil Engineering. THOMASON Civil Engineering Coll., 1866–77.
Italy. Congresso degli Ingegneri e degli Architetti Italiani. CONGRESSO, 1884.
—— International Congress of Engineers and Architects, Palermo, 1889. INTERNATIONAL Congress of E. and A.
—— Engineering and Architectural College. Rome. ROME, 1880–85.
Madrid. Corps of Engineers. MARTINEZ, 1864.
—— Escuela de ingenieros de caminos, canales y puertos. LOPEZ (M.), 1863; MADRID, 1865–86; MADRID. Add. 517.
New South Wales. History of Civil Engineering. WARREN (W. H.), 1888.
Spain. International Congress on Engineering. Barcelona, 1888. INTERNATIONAL Congress on E.
Switzerland. Société Vaudoise des Ingénieurs. Bulletin. SOCIÉTÉ Vaudoise des Ingénieurs, 1876, etc.
Tasmania. Reports. BELL (C. N.).
Turin Exhibition, 1884, Engineering at the. SACHERI.
United States. Matters of interest to Engineers in the United States. HEAD (J.), 1891.
—— American Engineer. PERIODICAL PUBLICATIONS, p. 9.
—— Visit of American Engineers to the United Kingdom. Reception by the Mayor of Liverpool. 1889. LIVERPOOL, p. 246.
—— American Society of Civil Engineers. AMERICAN Soc. of C. E.
—— American Society of Mechanical Engineers. AMERICAN Soc. of M. E.
—— Arkansas Society of Engineers, etc. ARKANSAS Soc.
—— Boston, Mass. Reports of the City Engineer, 1876, &c. BOSTON, p. 155.

ENGINEERING—*continued.*

United States. California. Report of State Engineer. CALIFORNIA, 1880–81.

—— Chicago International Engineering Congress. Papers read, etc., at the Civil, Military, and Naval Engineering Divisions. INTERNATIONAL Eng. Cong.; CHICAGO, 1893–4. Add. 491–2.

—— Colorado, Report of the State Engineer, 1885–90. COLORADO.

—— New York Submarine Engineering Company, Prospectus, 1860. NEW YORK Submarine.

ENGRAVING. BEVAN (G. P.), Industries, vol. 8.

Art of Copying Engravings. Thermography. HUNT (R.), 1842.

Report on the process of Engraving. VIAL (E.), 1864.

ENSILAGE.

Preservation of Corn by Ensilage. DOYÈRE, 1856, '62.

Remarks on Ensilage. ROBINSON (Prof. H.), 1885.

ENTOMOLOGY. United States, Entomology. UNITED States, pp. 344, 345.

Noctuidæ. GROTE (A. R.), 1878.

EPIDEMICS.

Duty of Engineers in sudden epidemics. KÜMMEL, 1893.

Prevention of. CHADWICK (Sir E.), 1882, p. 236. Prevention of children's epidemics by sanitation. CHADWICK (Sir E.), 1887, p. 235.

Cholera. HALY (G. T.), 1866.

—— Cholera and the Water Supply. MAIN (D. D.), 1853.

—— Causes, prevention, and cure. ANONYMOUS, 1831, p. 42.

—— Diarrhœa and dysentery. JEANNERET, 1857.

—— Nature and treatment. DRYSDALE, 1866.

—— Prompt and easy cure. JEANNERET, 1865.

—— England. Reports, 1848–49. Report on Mortality in England. PARLIAMENTARY..Papers, p. 469.

—— 1854. Letter of President of Board of Health; Report of Committee for Scientific Inquiries; Report of Medical Council of Board of Health; Report of results of different methods of treatment. PARLIAMENTARY..Papers, p. 470.

—— 1866. Report by Dr. W. Farr. PARLIAMENTARY..Papers, p. 470.

—— Gibraltar, 1865. GIBRALTAR.

—— Hamburg and Altona, Cholera at. KÜMMEL, 1893.

—— India. Cholera epidemic in connection with the Bengal Cyclone, 1877. INDIA, p. 110.

ELECTRICITY (ELECTRO-MOTIVE FORCE).
Generation of Electro-motive force in the coalfields, and its application to industrial centres. THWAITE (B. H.), 1893, p. 312.
Seat of electromotive forces in a voltaic cell. HOPKINSON (J.), 1885.
Treatment of electro-motive force between linear currents and conductors. CLAUSIUS, 1876.

ELECTRO-BIOLOGY. Elements. SMEE (A.), 1849.

ELECTRO-PLATING. URQUHART (J. W.), 1882, 1894.
Galvanoplastic Manipulations: a guide for the gold and silver Electroplater. ROSELEUR (A.), 1872.
Practical Guide for Gold and Silver Electroplater. WAHL (W.), 1883.
ELEPHANTS. Transport by railway. CLARKE (H. W.), 1879.

ELLIPSE.
Elements of the Ellipse. ADAMS (J.), 1818.
Elliptical movements. New calculations. SANG (E.), 1879.
EMBANKING.
Determination of surface. Cuttings and embankments. LALANNE, 1850.
Draining and consolidation. BRUÈRE, 1858.
Embanking Lands from the Sea. WIGGINS (J.), 1852, '67.
Embankments for retaining Water. MARSH (J. T.), 1865.
Methods of Calculating the Cubic Contents of Embankments by the aid of Diagrams. TRAUTWINE (J. C.), 1887.
Tables for calculating the cubic contents of Excavations and Embankments. HUDSON (J. R.), 1886.

India. Damoodah Embankments, Bengal, 1856–58. INDIA, p. 110.
—— Hidgelee Province Embankments. Report, 1861. INDIA, p. 119.
Mississippi. Principles and practice of embanking Lands from river-floods as applied to "levees" of the. HEWSON (W.), 1860.
Orissa Embankments. Report. TAYLOR (WILLIAM C.), 1872.
Scheldt (East). HAGEN, 1867.
Thames Embankment, Reports, Acts, Bills, Specifications, Contracts, etc. THAMES River, pp. 292–294.
—— Embankment between Blackfriars and Westminster Bridges. A letter. WOOD (Thomas L.), 1859
—— Proposed Isolated Embankment with side canal and marginal low-level intercepting sewer. WALMSLEY (E. B.), 1865.

EMBROIDERY. Art. COLE (A. S.), 1886.

EMIGRATION.

Emigration to the British Colonies. BATE, 1862.
London National Benevolent Emigration Fund. Correspondence, 1850. NATIONAL Benevolent.
National Colonial Emigration Society. Report, 1863. NATIONAL Colonial.
National importance of Emigration. BAGOT (C. H.), 1863.
Sidney's Emigrant's Journal. PERIODICAL PUBLICATIONS, p. 25.

America (North), Emigration to. NELSON (J.), 1869.
Argentine Republic as a field for European Emigration. LATZINA, 1883.
Australia. Lancashire Distress and Emigration to Australia. LANCASTER, 1863.
Canada, advantages of Emigration to. CATTERMOLE, 1831.
—— Successful Emigration to. TANNER (H.), 1884.
European. HEURTIER, 1854.
India. Madras. Report of the Protector of Emigrants, 1859–60. INDIA, p. 122.
New Zealand. Immigration, 1871–72. NEW ZEALAND, p. 410.
United States. Special Reports on Immigration. YOUNG (E.), 1872.

EMPLOYERS' LIABILITY. Report of Select Committee, 1877. PARLIAMENTARY..Papers, p. 477.

EMPLOYMENT. Chief cause of our want of it, with remedy. STANDFIELD (J.), 1880.

ENCYCLOPÆDIAS. *See* DICTIONARIES.

ENERGY. *See* POWER.

ENGINEERING.

Aid to Engineering Solution. JACKSON (L. d'A.), 1885.
Aid-book to Engineering Enterprise abroad. MATHESON, 1878–81, '89.
Aide-mémoire de l'ingénieur. HUGUENIN, 1887.
Annales du génie civil. PERIODICAL PUBLICATIONS, p. 10.
Annual Retrospect. BURNELL, 1862.
Archiv für die Artillerie- und Ingenieur-Offiziere, etc. PERIODICAL PUBLICATIONS, p. 11.
Art of the Engineer. BIROT, 1869, '83.
Building News and Engineering Journal. PERIODICAL PUBLICATIONS, p. 12.
Cadet Engineer, or Steam for the Student. LONG (J. H.) and Buel, 1865.

ENGINEERING—*continued.*

Civil Engineer and Architect. PERIODICAL PUBLICATIONS, p. 13.

Civil Engineering. CLEGG (S.) jun., 1849; HOSKING, 1841. Elementary Course, 1860. RANKINE (W. J. M.), 1863,' 73. Treatise, 1875. MAHAN.

—— Elements. MILLINGTON, 1843; SCOTT (M.), 1874, p. 176; WHEELER (J. B.), 1884.

Civil Engineer, Function of, in the Work of Colonisation. DOBSON, 1887. Future prospects of the profession. DAWSON (C. J. C.), 1870.

Civil Engineers' Pocket Book. TRAUTWINE (J. C.), 1872, 1888–94.

Civil Engineers' and Contractors' Estimate and Price Book. ATCHLEY, 1867.

Civilingenieur. PERIODICAL PUBLICATIONS, p. 13.

Civil and Mechanical Engineering. HALDANE, 1887, '90. SMITH (William), Noble and Smith, 1877. MS. Letters on, TREDGOLD (T.)

Collegio degl' Ingeneri ed Architetti. NAPLES. Add. 522.

Colonial Engineers, Information for. Pt. 1, Ceylon; pt. 2, Southern Africa; pt. 3, India. SPON (E. & F. N.), 1875–77.

Dictionary of Engineering. APPLETON (D.), 1857.

—— Spons' dictionary. BYRNE (O.), 1869–81.

—— Civil and Mechanical Engineering. Dictionary of terms used in. WEALE (J.), 1849–50, 1875.

Encyclopædia of Civil Engineering. CRESY, 1847.

Engineer. PERIODICAL PUBLICATIONS, p. 15.

—— Who is he and what has he done? HAUPT (L. M.), 1885.

—— Engineer of the Future. BARR (A.), 1888.

Engineer and Machinist. PERIODICAL PUBLICATIONS, p. 15.

Engineer and Machinist's Assistant. ANONYMOUS, 1853, p. 44.

Engineer and Machinist's Drawing Book. ANONYMOUS, 1853, p. 44.

Engineers' Club Papers. PHILADELPHIA, 1878, p. 33.

Engineers' Companion and Pocket Table Book. SCRIBNER (J. M.), 1878.

Engineers' Compendium. SEARS (J. E.), 1888–90.

Engineers' Field Book. CROSS (C. S.), 1890.

Engineers' Handbook. LOWNDES (C. S.), 1860.

Engineers' Handbook to the Local Marine Board Examinations. AINSLEY, 1868, 1886; REED (T.), 1879; THORN (W. H.), 1885.

Engineers' Handy Book. ROPER (S.), 1881.

Engineers' Holiday. PIDGEON, 1882.

Engineers' Journal. PERIODICAL PUBLICATIONS, p. 15.

Engineers' Pocket Book. ADCOCK (T.), 1861–88.

ENGINEERING—*continued.*

Engineers' Pocket Book for 1862–3, 1867–1880.
ANONYMOUS. Add. 481.

Engineers' Price Books, Diary and Reference Books, etc.
SPON (E. and F. N.), 1876–92

Engineers' Year-Book of formulæ, rules, tables, data and memoranda. KEMPE (H. R.), 1894.

Engineers and Officials. ANONYMOUS, 1856, p. 45.

Engineering. PERIODICAL PUBLICATIONS, p. 15.

Engineering and Mining Journal. PERIODICAL PUBLICATIONS, p. 15.

Engineering as a Learned Profession.
THURSTON (R. H.), 1894, p. 309.

Engineering during the last half century.
VERNON-HARCOURT (L. F.), 1891.

Engineering Calculations. Calculating Series. GANGA Ram, 1884.

Engineering Club. Rio de Janeiro.

Engineering Construction. PHIPPS, 1874

—— Pattern Making. ANONYMOUS, 1885, p. 51

—— Construction in Iron, Steel and Timber.
WARREN (W. H.), 1894

Engineering Drawing. CLARKE (G. S.), 1884; Workman's Manual. MAXTON, 1886.

Engineering Estimates, Cost and Accounts.
ANONYMOUS, 1890, p. 44.

Engineering Exchange, London. BOLTON (R.), 1892.

Engineering Facts and Figures. PERIODICAL PUBLICATIONS, p. 15.

Engineering Field Work. BRUFF (P.), 1840.

Engineering Literature, Index.
ASSOCIATION of Engineering Societies.

Engineering News. PERIODICAL PUBLICATIONS, p. 15.

Engineering notes. ROBERTSON (F.), 1873.

Engineering Plagiarist, or Dodd from Phillips exposed.
ANONYMOUS, 1795, p. 45.

Engineering Science handbook. BECKER (M.), 1857–61.

Engineering and Architecture. The line of demarkation between.
WILSON (Joseph M.), 1887.

Engineering and Engineers. MARTINDALE, 1871.

Foreman Engineer and Draughtsman.
PERIODICAL PUBLICATIONS, p. 15.

Formularies for the Engineer. ARMENGAUD, 1881.

General and alphabetical handbook. RICHARD (G. T.), 1848–54.

Génie civil. PERIODICAL PUBLICATIONS, p. 15.

Génie industriel. PERIODICAL PUBLICATIONS, p. 15.

Giornale del genio civile. PERIODICAL PUBLICATIONS, p. 16.

Glossary. BREES, 1841, 1853.

ENGINEERING—*continued.*

Graphic tables. LALANNE, 1846, 1879.
High School for Mathematics and Engineering Prospectus, 1841. HIGH School.
Hints to young Engineers. WILSON (Joseph W.), 1874.
Ingegneria civile e le arti industriali. PERIODICAL PUBLICATIONS, p. 16.
Ingener [Russian]. PERIODICAL PUBLICATIONS, p. 16.
Ingénieur: Journal scientifique. PERIODICAL PUBLICATIONS, p. 17.
Ingenieur: Zeitschrift. PERIODICAL PUBLICATIONS, p. 16.
Ingenieur Kalender. FEHLAND, 1882, etc.
Ingenieurs Taschenbuch. ANONYMOUS, 1887, 1892, p. 47.
Machinery and Appliances used in Engineering Works. HILL (W.), 1886.
Manuel de l'ingénieur. COLOMBO, 1882.
Materials of Engineering. THURSTON (R. H.), 1883, p. 310.
Mechanical Engineering. ADAMS (H.), 1883; CAMPIN, 1863; FAIRBAIRN (Sir W.), 1860, p. 403; IMRAY and Biggs; LINEHAM (W. J.), 1894. Add. 515.
—— Complete course of Mechanical Engineering drawing. ARMENGAUD (J. E.), 1853.
—— Developments of, during the last half century. BRAMWELL (Sir F. J.), 1882, p. 169.
—— Graphics applied to. SMITH (Robert H.), 1889.
Mechanical Engineering Materials, properties and treatment in construction. MARKS (E. C. R.), 1893.
Mechanical Engineering Students, Advice to. PERRY (Prof. J.), 1888, p. 29.
Mechanical Engineers, Handbook for. ADAMS (H.), 1891–93.
—— Office Book. FOLEY, 1881. Reference Book, FOLEY, 1891.
—— Rules, tables and data for Mechanical Engineers. CLARK (D. K.), 1877.
Mechanical Principles. MOSELEY, 1843, '55.
Mechanic's, machinist's and engineer's book of reference. HASLETT, 1871.
Mechanics of Engineering. CHURCH (J. P.), 1888; WHEWELL (W.), 1841.
Mechanics' Own Book. SPON (E. and F. N.), 1886.
Military Engineering, elementary course. MAHAN, 1867.
—— Text book of. WHEELER (J. B.), 1884.
Models, need of, and drawings to accompany communications relative to the construction and details of Engineering Works. GRAINGER (T.), 1849.
Modern Engineering. McALPINE, 1874; Record of its progress, 1863–66. HUMBER.

ENGINEERING—*continued.*

Modern Mechanical Engineering and Machine Making.
BURN (R. S.), 1888.

Municipal Engineering BOULNOIS, 1891.

Municipal and Sanitary Engineers' Handbook.
BOULNOIS, 1888, 1892.

Notes and formulæ of the Engineer and the Constructor Mechanician. LAHARPE, 1893.

Outside the class-room: thoughts for young engineers.
BAILEY (W. H.), 1891.

Papers on Engineering. WEALE (J.), 1843–49.

Paris Exhibition of 1878. Engineering at.
MORISON (G. S.), North, and Bogart, 1878.

Past Progress and Present Results in some branches. POWRIE, 1888.

Pioneer Engineering: Operations connected with the settlement of waste lands in new countries. DOBSON, 1877.

Pocketbook. NYSTROM, 1870.

Pocketbook of Engineering. GANGA Ram, 1888. Add. 502.

Pocketbook of useful Formulæ and Memoranda for Civil and Mechanical Engineers.
MOLESWORTH, 1863, '71, '76, '79, '90, '93.

Politecnico. Giornale dell' ingegneri, architetti civili ed industriali.
PERIODICAL PUBLICATIONS, p. 21.

Ponts et Chaussées, École des. FRANCE, 1834, '70, p. 435; GŒURY, 1806–7; LESAGE, 1810; SAINT VENANT (A. J. C. B. de), 1838. Works. COURTIN, 1812.

—— Annales des Conducteurs des Ponts et Chaussées.
PERIODICAL PUBLICATIONS, p. 10.

—— Annales des Ponts et Chaussées.
PERIODICAL PUBLICATIONS, p. 10.

—— Annuaire du Corps Royale des Ponts et Chaussées, etc.
PERIODICAL PUBLICATIONS, p. 11.

—— Canals, Suspension Bridges, Dams, etc. CORDIER, 1823–28.

—— Catalogues 1872, '73, '81, '86. Collection of designs, 1820, 1857, etc. Decrets, 1867. Laboratories, 1891. Lectures, 1847, etc. Notes, 1844, etc. Programmes, etc.
PARIS, pp. 453–54.

—— Conditions imposed on Contractors. CHATIGNIER, 1857.

—— Course of construction, with applications drawn from the art of the engineers of the "Ponts et Chaussées."
SGANZIN, 1839–41.

—— Dictionary. EXCHAQUET, 1787.

—— Hainaut. HAINAUT, 1879.

—— Laws, etc. POTERLET, 1820.

—— Manual, 1871–78. Materials of Construction, 1885.
DEBAUVE.

ENGINEERING—*continued.*

Ponts et Chaussées, École des. Manuel du Conducteur. ENDRES, 1857.

—— France and England. DUPIN, 1818, '20.

—— Mode of recruiting for the Corps des ponts et chaussées. SOCIÉTÉ des Ingénieurs Civils, 1848.

—— Models, charts, etc., relating to the works of the "Ponts et Chaussées" and mines. PHILADELPHIA (1876), p. 33.

Practical Engineer's Handbook. HUTTON (W. S.), 1887.

"Practical Engineer" Pocket Book and Diary. ANONYMOUS, 1891, etc., p. 52.

Principles and practice of Civil Engineering. CONYBEARE, 1857–59.

Railroad and Engineering Journal. PERIODICAL PUBLICATIONS, p. 22.

Rivista di Artiglieria e genio. PERIODICAL PUBLICATIONS, p. 24.

Road book for Engineers. EYTH, 1871.

Romance of Engineering. FRITH, 1892.

Royal Engineer. HEAD (Sir F. B.), 1869.

—— Aide-Mémoire for the use of officers. Formulæ, tables, etc. COOKE (A. C.), 1876–83.

—— Department: its work and estimates. ROYAL Engineers, 1862.

—— Field Operations at Kassassin and the lines of Tel-el-Kebir. ROYAL Engineers, 1882.

—— Field service Pocketbook. SCOTT-MONCRIEFF (Major G. K.), 1894.

—— History of the Corps. PORTER (W.), 1889.

—— Royal Engineers Journal. PERIODICAL PUBLICATIONS, p. 24.

—— Operations conducted by the Corps of the Royal Engineers. From the invasion of the Crimea to the fall of Sebastopol. ROYAL Engineers, 1859.

—— Professional Papers and others relating to the Corps. ROYAL Engineers, 1837–77, 1893.

—— Report on employment of Royal Engineers in civil departments of the State. ROYAL Engineers, 1871.

Rudiments of Civil Engineering. LAW (H.), 1850, '54, '62, '81.

Sanitary. *See* SANITATION.

Sappers and Miners. Handbook for officers. PASTEUR (J. D.), 1837–38.

Scales. System and List of Scales of equal parts applicable to Engineering. HOLTZAPFFEL (C.), 1838; HOLTZAPFFEL (C.), 1838. App. 562.

Science and Art of the Engineer. COLLIGNON (E.), 1892.

Science of the Engineer. CLAUDEL, 1857.

Specifications and Contracts. HAUPT (L. M.), 1878.

ENGINEERING—*continued.*

Specifications of Works (Civil and Mechanical Engineering). BLENKARN, 1865.
Study. KNIGHT (Cameron), 1869.
Study and practice. FIDLER, 1891.
Stummer's Ingenieur. PERIODICAL PUBLICATIONS, p. 25.
Surveyor, Engineer, and Architect. PERIODICAL PUBLICATIONS, p. 25.
Tables, formulas, etc. CANTALUPI, 1852; LACROIX (E.), 1869–88.
Theory. GROSHOF, 1879–90.
Theory and practice of the art of the engineer and of the constructor of machines, etc. VIGREUX (L.), 1887.
Useful Information for Engineers. FAIRBAIRN (Sir W.), 1856–66, p. 403.
Van Nostrand's Eclectic Engineering Magazine. PERIODICAL PUBLICATIONS, p. 26.
Works Manager's Handbook. HUTTON (W. S.), 1855, '90.
Workshop manipulation. Its Economy. RICHARDS (J.), 1876.
Workshop Receipts. SPON (E. and F. N.), 1873–92.
Workshops. Establishment at Creusot. CREUSOT, 1828.
—— Chevalier (V.), aîné. Inventions. CHEVALIER, 1824. App. 551.
—— Establishment of John Cockerill at Seraing. LECOCQ, 1854.
—— Workshops of M. Hallette. SÉGUIER (A. P.), 1846.
Young Engineer's Own Book. ROPER (S.), 1884.

America, North, Civil Engineering of. STEVENSON (D.), 1838, '59.
Argentine Republic. ARGENTINE.
Australia, South, Engineering Department. Return of Employés. SOUTH AUSTRALIA, 1867, p. 227.
Bayerischer Architekten- und Ingenieur-Verein. BAYERISCHER, 1874–77.
Bristol, Engineer's views on the government of. BRISTOL, 1893.
British Engineers, Considerations on the Establishment of; BRUCE (R. G.), 1768. Future of. PRELLER, 1893.
—— Engineering Notes from England. TRAUTWINE (J. C.), junior, 1889.
—— Civil and Mechanical Engineering in Lancashire and Cheshire. FAIRBAIRN (Sir W.), 1869, p. 403.
—— Scotland, Marine, Hydraulic, and Sanitary Engineering in. ROBERTSON (G.), 1867.
Cape Colony. Report of the Colonial Engineer for 1863. CAPE COLONY, 1864, p. 221
Germany. Deutsche Bauzeitung. PERIODICAL PUBLICATIONS, p. 13.
India. CUNNINGHAM (A.), 1871–8; DANVERS, 1868. Examination Papers, 1851–68, 1859–69. INDIA, pp. 100, 101.

EPIDEMICS—*continued.*

Cholera, London. Relation of Meteorology to the epidemic, 1855. LONDON, p. 262.

—— Two epidemics, effect of impure water, 1856. LONDON, p. 255.

—— Epidemic of 1866. LETHEBY.

—— Malta, 1865. MALTA.

—— Marseilles. GUÉRARD, 1885, '86.

—— Oxford, 1854. ACLAND (Dr. H. W.), 1850.

Enteric Fever. Croydon, Enteric Fever at, in 1875. BUCHANAN (Dr. G.), 1876.

—— Glasgow, Report on the outbreak in. RUSSELL (James B.), 1878.

—— Red Hill and Caterham, Epidemic of Enteric Fever affecting especially. Report to the Local Government Board. THORNE (T.), 1879.

—— Tees Valley, 1891. PARLIAMENTARY..Papers, p. 485.

Typhus epidemic at Altona, 1891. KÜMMEL.

See also DISEASES.

EQUILIBRIUM.

Fundamental principles. CARNOT, 1809.

Equilibrium of a Spherical Envelope. MAXWELL (J. C.), 1867.

—— of Elastic Solids. MAXWELL (J. C.), 1856.

Laws of Equilibrium the same in physical, chemical and mechanical phenomena. LE CHATELIER (H.), 1887.

ESTIMATES. Examples of Estimating. KEAY, 1866.

ESTUARIES.

Silting in Estuaries. Principal causes. STEVENSON (T.), 1885.

Lincolnshire Estuary Plans and Sections, 1850. LINCOLN (County of).

—— Inquiry on Lincolnshire Estuary Bill, 1851. LONDON (County of).

—— Lincolnshire and Norfolk Estuary. Map. FROW, 1866.

Norfolk Estuary, Report on. RENDEL (J. M.), 1840; STEPHENSON (R.), 1849.

Norfolk. The Wash. Act for enclosing and reclaiming certain tracts of land, 1846. Amendment Bill, 1849. Papers and Maps, 1846–50. Evidence before Committee of House of Commons, 1849. Report of Inspectors, 1849. Report of the Admiralty, 1849. Proceedings of Meeting of Proprietors, 1850. NORFOLK Estuary.

Norfolk Estuary Bill. Evidence before Committee of the House of Lords, 1877. NORFOLK Estuary.

Plymouth, Estuaries and Tidal Lands of. WORTH (R.H.), 1891.

Venetian BOCCI, 1890.

ENGINEERING—*continued.*

United States. California. Report of State Engineer. CALIFORNIA, 1880–81.

—— Chicago International Engineering Congress. Papers read, etc., at the Civil, Military, and Naval Engineering Divisions. INTERNATIONAL Eng. Cong.; CHICAGO, 1893–4. Add. 491–2.

—— Colorado, Report of the State Engineer, 1885–90. COLORADO.

—— New York Submarine Engineering Company, Prospectus, 1860. NEW YORK Submarine.

ENGRAVING. BEVAN (G. P.), Industries, vol. 8.

Art of Copying Engravings. Thermography. HUNT (R.), 1842.

Report on the process of Engraving. VIAL (E.), 1864.

ENSILAGE.

Preservation of Corn by Ensilage. DOYÈRE, 1856, '62.

Remarks on Ensilage. ROBINSON (Prof. H.), 1885.

ENTOMOLOGY. United States, Entomology. UNITED States, pp. 344, 345.

Noctuidæ. GROTE (A. R.), 1878.

EPIDEMICS.

Duty of Engineers in sudden epidemics. KÜMMEL, 1893.

Prevention of. CHADWICK (Sir E.), 1882, p. 236. Prevention of children's epidemics by sanitation. CHADWICK (Sir E.), 1887, p. 235.

Cholera. HALY (G. T.), 1866.

—— Cholera and the Water Supply. MAIN (D. D.), 1853.

—— Causes, prevention, and cure. ANONYMOUS, 1831, p. 42.

—— Diarrhœa and dysentery. JEANNERET, 1857.

—— Nature and treatment. DRYSDALE, 1866.

—— Prompt and easy cure. JEANNERET, 1865.

—— England. Reports, 1848–49. Report on Mortality in England. PARLIAMENTARY..Papers, p. 469.

—— 1854. Letter of President of Board of Health; Report of Committee for Scientific Inquiries; Report of Medical Council of Board of Health; Report of results of different methods of treatment. PARLIAMENTARY..Papers, p. 470.

—— 1866. Report by Dr. W. Farr. PARLIAMENTARY..Papers, p. 470.

—— Gibraltar, 1865. GIBRALTAR.

—— Hamburg and Altona, Cholera at. KÜMMEL, 1893.

—— India. Cholera epidemic in connection with the Bengal Cyclone, 1877. INDIA, p. 110.

EPIDEMICS—*continued.*

Cholera, London. Relation of Meteorology to the epidemic, 1855. LONDON, p. 262.

—— Two epidemics, effect of impure water, 1856. LONDON, p. 255.

—— Epidemic of 1866. LETHEBY.

—— Malta, 1865. MALTA.

—— Marseilles. GUÉRARD, 1885, '86.

—— Oxford, 1854. ACLAND (Dr. H. W.), 1850.

Enteric Fever. Croydon, Enteric Fever at, in 1875. BUCHANAN (Dr. G.), 1876.

—— Glasgow, Report on the outbreak in. RUSSELL (James B.), 1878.

—— Red Hill and Caterham, Epidemic of Enteric Fever affecting especially. Report to the Local Government Board. THORNE (T.), 1879.

—— Tees Valley, 1891. PARLIAMENTARY..Papers, p. 485.

Typhus epidemic at Altona, 1891. KÜMMEL.

See also DISEASES.

EQUILIBRIUM.

Fundamental principles. CARNOT, 1809.

Equilibrium of a Spherical Envelope. MAXWELL (J. C.), 1867.

—— of Elastic Solids. MAXWELL (J. C.), 1856.

Laws of Equilibrium the same in physical, chemical and mechanical phenomena. LE CHATELIER (H.), 1887.

ESTIMATES. Examples of Estimating. KEAY, 1866.

ESTUARIES.

Silting in Estuaries. Principal causes. STEVENSON (T.), 1885.

Lincolnshire Estuary Plans and Sections, 1850. LINCOLN (County of).

—— Inquiry on Lincolnshire Estuary Bill, 1851. LONDON (County of).

—— Lincolnshire and Norfolk Estuary. Map. FROW, 1866.

Norfolk Estuary, Report on. RENDEL (J. M.), 1840; STEPHENSON (R.), 1849.

Norfolk. The Wash. Act for enclosing and reclaiming certain tracts of land, 1846. Amendment Bill, 1849. Papers and Maps, 1846–50. Evidence before Committee of House of Commons, 1849. Report of Inspectors, 1849. Report of the Admiralty, 1849. Proceedings of Meeting of Proprietors, 1850. NORFOLK Estuary.

Norfolk Estuary Bill. Evidence before Committee of the House of Lords, 1877. NORFOLK Estuary.

Plymouth, Estuaries and Tidal Lands of. WORTH (R.H.), 1891.

Venetian BOCCI, 1890.

ETHER. Discovery. DANA (R. H.), 1848.

ETHNOLOGY.
Bureau of Ethnology, Smithsonian Institution. Reports, 1881, etc. SMITHSONIAN INST.
Female of the white race part of whose skin resembles that of a negro. WELLS (W. C.), 1818.
Various tribes of the Mysore Province. PUCKLE, 1867.

EVAPORATION.
Experimental researches. COLLIER, 1866.
Multiple system in vacuum and open air. FOSTER (J.), 1890.

EVIDENCE. Nature of demonstrative. BEDDOES, 1793.

EXAMINATIONS (COMPETITIVE).
Importance of, for admission to the public service. CHADWICK (SIR E.), 1857, p. 234.
Cape Colony. Reports of the Board of Public Examiners, 1861–65. CAPE Colony, p. 221.

EXCAVATING MACHINERY. Excavators. REEVES (F. W.), 1878; SCHRABETZ, 1889.

EXCAVATIONS. Contents of Area of Slopes. BIDDER.
Around the Maison-Carrée. SEYNES, 1824.

EXHIBITIONS. WOOD (Sir H. T.), 1886.
Agricultural Implements, Liverpool, 1841. Report. PARKES (J.).
Colonial and Indian, London, 1886. Report of Royal Commission, 1887. Report of Reception Committee, 1886. Reports on the Colonial Sections, 1887. LONDON, p. 257.
—— Engines and boilers driving Electric light Machinery. DAVEY, Paxman & Co.
—— Malta, etc., Views of. MALTA.
—— New Zealand Court. Geological Exhibits. HECTOR.
—— New Zealand Exhibits. LONDON, p. 257.
—— Victoria, Australia. Illustrated Handbook. LONDON, p. 257.
—— West Indian Court. West Indies and British Honduras. LONDON, p. 257.
Electric and Gas Exhibition, Crystal Palace, 1881–2. Report on the Gas Section. INCORPORATED Gas Inst.
Electric, Glasgow. Apparatus for the Utilisation of Gas, Electricity, etc., 1880. Reports. GLASGOW.
—— Lille, International Exhibition of Electricity, 1881. Electrical apparatus exhibited by the Chemin de fer du Nord. CHEMIN de fer.

EXHIBITIONS—*continued.*

Electric. London Electrical Exhibition, 1891. Official Catalogue. LONDON, p. 257.
—— Paris, Electricity, 1881. HEAP (D. P.); PARIS. Add. 525.
—— —— Catalogue, Jury Reports, 1883. Report, 1884. Réunion des électriciens. PARIS, p. 459.
—— Paris, 1883. ALLARD, etc.
—— Paris, 1889. Electric Lighting. FONTAINE.
—— Philadelphia International Electrical Exhibition, 1884. Official Catalogue. FRANKLIN Institute; PHILADELPHIA, p. 33.
—— —— Subject Catalogue of Memorial Library. FRANKLIN Institute.
—— Vienna, 1883. VIENNA.
Engineering and Metal Trades Exhibition, London, 1883. Catalogue. LONDON, p. 257.
Fisheries Exhibition, London, 1883. Official Catalogue. Awards of International Juries. LONDON, p. 259.
French Industry, 1839. JOBARD, 1841–42.
German Exhibition, London, 1891. Fine Art Section. LONDON, p. 257.
Health Exhibition, London, 1884. Awards by International Juries. Catalogue for Jury. LONDON, p. 259.
—— Education Department, Japan. Education in Japan. LONDON, p. 259.
—— Education Division. Special Catalogue. LONDON, p. 259.
—— Health Exhibition Literature. LONDON, p. 259.
—— Sanitary Bureau of the Japanese Home Department. LONDON, p. 259.
Intercolonial, 1866. Mining and mineral Statistics. SMYTH (R. B.), 1866.
Inventions Exhibition, London, 1885. Official Catalogue. LONDON, p. 259.
Maritime Exhibition, Havre, 1869. Rules. HAVRE.
—— Havre, 1887. Models, maps, etc., of the Ponts et Chaussées. HAVRE.
Milling Machinery Exhibition, London, 1881. Catalogue. LONDON, p. 259.
Mining Exhibition, Glasgow, 1885. MINING Institute of Scotland; Catalogue, 1885. GLASGOW.
Mining and Metallurgy, London, 1890. Prospectus, Catalogue. LONDON, p. 258.
—— African (South) Section. Handbook. LONDON, p. 258.
—— Australia (South). Record of Mines. Mineral Statistics. LONDON, p. 259.
—— Australia (Western). Catalogue of Exhibits. LONDON, p. 259.

EXHIBITIONS—*continued.*

Mining and Metallurgy, London, 1890. New South Wales. Mineral Wealth, Exhibits. LONDON, p. 259.

—— New Zealand. Catalogue of Minerals. LONDON, p. 259.

—— Tasmania. Tin Ore, Cornwall. LONDON, p. 259.

—— Uruguay. LONDON, p. 259.

Naval and Submarine Engineering Exhibition, London, 1882. Catalogue. LONDON, p. 260.

Naval Exhibition, London, 1891. Catalogue and Guide. LONDON, p. 260.

—— Exhibit of Models of Ships and Engineering Works. THAMES IRONWORKS and Shipbuilding Co.

Naval Architecture Exhibition. Marine Engineering, etc. Tynemouth, 1882. Official Catalogue. TYNEMOUTH, 1882.

Naval and Marine Engineering Exhibition, Glasgow, 1880–81. GLASGOW.

Portraits (National), Catalogues of 2nd and 3rd Exhibitions, 1867–68. SOUTH Kensington Museum.

Railways, Paris, 1887. Official Catalogue. PARIS. Add. 525.

Robertson's Fantasmagoria. ROBERTSON.

Sanitary Appliances, Eastbourne, 1881. EASTBOURNE.

Sanitary Institute of Great Britain. Exhibition held at Leamington 1877. SANITARY Inst.

Scientific Apparatus, 1876. SOUTH Kensington Museum, 1876.

Sheepshanks Exhibition Examination. SHEEPSHANKS Exhibition, 1861–66.

Water Supply Exhibition, London, 1879. Handbook. LONDON, p. 259.

EXHIBITIONS (PLACES).

Adelaide Jubilee Exhibition, 1887. ADELAIDE, 1886.

African (South) Exhibition, 1885. Album of Views. PORT ELIZABETH.

American Institute, 1871. Report on Steam Boiler tests. THURSTON (R. H.), 1872, p. 310.

Amsterdam, 1883. Exhibits from New South Wales. AMSTERDAM.

—— Marbles. DERVILLÉ and Cie.

Amsterdam, 1884. Metallurgica products. BOUTMY, 1884.

Antwerp, 1885. Report of Committee of Industry; and Report of Jury of Awards. ANTWERP, 1887.

—— 1886. Marine. GAUDRY.

Barcelona, 1887–88. BARCELONA.

Bordeaux. Annual Exhibition of the products of Arts and Industry. BORDEAUX, 1827.

EXHIBITIONS (PLACES)—*continued.*

Brussels, 1878. BRUSSELS.

Brussels, 1887. Grand Concours. BRUSSELS, 1887.

Calcutta, 1883–84. Official Report, 1885. INDIA, p. 114.

Chicago, 1873. Cunard Line and the World's Fair. CUNARD.

Chicago, 1893. Apparatus for Illumination exhibited in the Palace of Electricity by the French Lighthouse Service. CHICAGO, 1893.

—— British Royal Commission. Handbook of Regulations and Official Catalogue. CHICAGO, 1892–93.

—— British Section. Report of the Royal Commission. CHICAGO, 1894. Add. 491.

—— International Engineering Congress at, and views of the various buildings. CHICAGO, 1893–4. Add. 491–2.

—— Engineering Societies. CHICAGO, 1893.

—— Exhibit of Lehigh University. CHICAGO, 1893.

—— Exhibits of Portuguese Civil Engineers. CHICAGO, 1893.

—— Stratigraphical Collection of Canadian Rocks. FERRIER.

—— What is the proper housing for the exhibition. JENISON, 1890.

Cincinnati. Report. CINCINNATI, 1875.

—— Millers' International Exhibition. Report on the test trials of the Automatic Cut-off Steam Engines. CINCINNATI, 1880.

Cordova, Argentine Republic. CORDOVA, 1870–73.

Dublin, 1855. LAMBERT.

—— 1865. Official Catalogue. Italian Exhibits. DUBLIN.

—— Jury Awards. Carriages, Saddlery and Harness. DUBLIN.

Düsseldorf Exhibition of Art and Industry, 1880. IRON and Steel Inst.

Florence, 1861. Report on Agudio Traction Engine. AGUDIO, 1861.

Glasgow International, 1888. Catalogue, Guide. Fine Arts Section. GLASGOW.

Glasgow Philosophical Society's Exhibition of models, manufactures, natural history, paintings, etc. Catalogue. GLASGOW, 1846. Add. 503.

Grahamstown, 1887. Model of Underground De Beers. DE BEERS, 1887.

Hyderabad, 1856. Catalogue. INDIA, p. 120.

Liverpool, 1886. Development of the Steamship. CHADWICK (F. E.), 1887.

—— Lifts and Pneumatic Railway. GONIN (L.), 1886.

—— Imperial Jubilee Exhibition, 1887. Prospectus, regulations, etc. LIVERPOOL, p. 246.

London. Four National Exhibitions in London and their Organiser. LOWE (C.), 1892.

EXHIBITIONS (PLACES)—*continued.*

London, 1851. BABBAGE (C.), 1851.
—— Preliminary proceedings. SOCIETY for the Encouragement of Arts, etc., 1850, p. 222.
—— Illustrated Catalogue. Reports of Commissioners. Reports by the Juries. LONDON, p. 257.
—— Building in Hyde Park. DOWNES.
—— Construction of Buildings of. WYATT (M. D.), 1851.
—— Catalogue of Works referring to. DILKE, 1855.
—— Prize Treatise on the Fine Arts Section. WEEKES (H.), 1852.
—— Lectures on the results. Proceedings preliminary to the Exhibition. LONDON, p. 257.
—— Machinery. CRISTOFORIS, 1852.
—— Musical Instruments in. POLE, 1851.
—— Crystal Palace. Fine Art Courts in. WYATT (M. D.) and Waring, 1854.
London International Exhibition, 1862. MEWBURN.
—— Decision of Commissioners on points relating to the Exhibition. LONDON, p. 258.
—— Illustrated Catalogue. Jury Reports. French Jury Reports. Medals Awarded. LONDON, p. 258.
—— How are the working classes throughout the country to get to it. BOWLEY, 1862.
—— Belgium. Catalogue. LONDON, p. 257.
—— Civil Engineering, etc. Report of Jury. LONDON, p. 258.
—— France. Agriculture. LONDON, p. 258.
—— Horological Instruments. Report of Jury. LONDON, p. 258.
—— India. Catalogue of Contributions from. DOWLEANS, 1862; LONDON, p. 258.
—— Industrial Department. Catalogue. LONDON, p. 258.
—— Machinery. CLARK (D. K.), 1864.
—— Rapport sur les travaux publics. BOMMART.
—— Railways. Imperial Royal Austrian State Railway Company, objects sent. LONDON, p. 258.
—— Chemin de fer du Nord. Three types of locomotives. PETIET (J.), 1862.
—— Scientific Record. JOHNSON (J. H.) and Mallet.
—— Tasmania. Products and Resources. WHITING (G.)
—— Zollverein. Catalogues. LONDON, p. 258.
London Annual International, 1871, '72, '73, and '74. Report. COLE (H.).
—— International Exhibition, 1872. Official Catalogue, Fine Arts Department. Official Reports. Ceremonial of Opening. London, p. 258.

EXHIBITIONS (PLACES)—*continued.*

Lyons, 1889. MALO.
Madras, 1855. Reports of Juries. INDIA, p. 122.
Madras, 1857. Official Catalogue. INDIA, p. 122.
—— Catalogue of Raw Produce. HAWKES, 1857.
Melbourne, 1880. Official Catalogue, 1880. Designs, Models, etc., of the "Ponts et Chaussées," 1880. List of Awards, 1881. MELBOURNE.
Milan, 1881. Conferences, etc. MILAN.
—— Machinery gallery. COLOMBO (G.), 1882.
Nagpore, 1865. Report. INDIA, p. 126.
New York Industrial Exhibition, 1853. Special Report. WHITWORTH (Sir J.). Notes. LAMBERT, 1855.
New York Centennial Exhibition, 1876. ERICSSON, 1876.
New Zealand, 1865. Awards of jurors. DUNEDIN.
—— Colonial Woods. BALFOUR (J. M.), 1865.
New Zealand Industrial Exhibition, 1885. Official Record. WELLINGTON, N. Z., 1886.
Palermo, 1892. Catalogue of the Collection of the Ministry of Public Works. PALERMO.
Paris, 1823. Pons' clock and watch manufacture. PONS (H.), 1823. App. 572.
Paris, 1834. Industrial mechanics. FLACHAT, 1835.
Paris Exhibition, 1849. WYATT (M. D.), 1849.
Paris, 1855. Guide. NAPOLEON (Prince).
—— History. ROBIN (C.), 1856.
—— Second letter on Mr. T. Stevenson's claims. REYNAUD (L.), 1856.
—— Notice of objects exhibited. DEROSNE and Cail, 1855.
—— Official Catalogue. British Section Catalogue. Reports, 1856. Jury Reports, 1856. PARIS, p. 456.
—— Report. GIRARDIN, Cordier and Burel, 1856.
—— Visit to. TRESCA (H.).
—— Materials of construction. DELESSE, 1856.
—— Navigation Instruments. SMYTH (C. P.), 1855.
—— Wines of the Gironde. Chateau Lafitte. GOUDAL, 1855.
—— Report on Furniture and Decorations. WYATT (M. D.), 1856.
Paris, 1862. Materials of Construction. DELESSE, 1863.
Paris, 1865. Painting, Sculpture. DUCAMP, 1855.
Paris, 1867. ROUVIERE, 1868. Reports of United States Commissioners, 1870. PARIS, p. 456.
—— Reports of International Jury, 1868. PARIS, p. 456–7.
—— Visit of an engineer. OPPERMANN, 1867.
—— Artisans' Reports (Society of Arts) PARIS, p. 457.

EXHIBITIONS (PLACES)—*continued.*

Paris, 1867. Ministère de l'Agriculture. PARIS, p. 456.
—— Report on Asphalt and Bitumen. BECKWITH, 1868.
—— Report on Coignet's concrete, its fabrication and uses, 1868. PARIS, p. 456.
—— Arts of decoration at. WYATT (M. D.), 1868.
—— Industry of the 19th century. LACROIX (E.)
—— Report on Machines and Mechanical Apparatus. MALLET (R.)
—— Corps impérial des Mines. PARIS, p. 456.
—— Safes' Challenge Contest. MALLET (R.) and Fairlie.
—— Telegraph Apparatus. SABINE (R.), 1867.
—— Section of Timber. EMY, 1869–73.
—— Aisne, Departement de l', 1868. PARIS, p. 456.
—— British Guiana, Contributions from. Catalogue of Products of New South Wales. PARIS, p. 456.
—— Spain, Public Works in. PARIS, p. 456.
Paris, 1878. Congresses and Conferences at the Palais du Trocadéro. PARIS, p. 457.
—— Buildings of the Exhibition. PARIS, p. 457.
—— Apparatus of Muller and Fichet. MULLER, 1878, p. 384.
—— Collieries. BURAT.
—— Engineering. MORISON (G. S.), North and Bogart, 1878.
—— Fortifications (Dépôt des). PARIS, p. 457.
—— Hydrometric Apparatus. HARLACHER.
—— Industry of the 19th century (part 2). LACROIX.
—— Iron and Steel at the Exhibition. BOUHY, 1879.
—— Materials of Construction. PARIS, p. 457.
—— Metallurgy. LEBASTEUR, 1878.
—— Notes on pieces of Phosphor Bronze. RUOLZ-MONTCHAL (H. de) and Fontenay, 1878.
—— Ponts et Chaussées (Models, etc.). PARIS, p. 457.
—— Railways (Austrian). PARIS, p. 457.
—— Schneider and Co.'s exhibits. PARIS, p. 457.
—— Whitworth (Sir Joseph) and Co.'s exhibits. PARIS, p. 457.
—— Australian (Western) Section. PARIS, p. 457.
—— British Section. PARIS, p. 457.
—— British India. PARIS, p. 457.
—— Canadian minerals. HARRINGTON, B. J., and Selwyn, 1878.
—— China. PARIS, p. 457.
—— Finland. Grand Duchy of. IGNATIUS, 1878; PARIS, p. 457.
—— Italy. PARIS, p. 457.
—— Norwegian Industries. Report. STØRMER (F.), 1880.
—— Portugal. PARIS, p. 457.

EXHIBITIONS (PLACES)—*continued.*

Paris, 1878. United States Commissioners' Reports, 1880. PARIS, p. 458.
—— Victoria Commissioners' Report, 1879. PARIS, p. 458.
Paris, 1889. CHANUTE, 1890; CHARTON (J.), 1889; PARVILLE.
—— Centennial Exhibition, 1789–1889 (proposed). ROBINSON (Armand), 1886.
—— Bulletin officiel. PARIS, p. 458.
—— Catalogue officiel. PARIS, p. 458.
—— Anthropological Sciences, Arts et Métiers. PARIS, p. 459.
—— Architects' Congress. PARIS, p. 458.
—— Artillery at. VEYRINES (P.), 1890.
—— Boring in Mines. HABETS, 1892.
—— Building Congress. PARIS, p. 458–9.
—— Chemistry Congress. PARIS, p. 458.
—— Miscellaneous Congresses. PARIS, pp. 458, 459.
—— Processes of working Coal Mines. DUJARDIN-BEAUMETZ.
—— Rewards obtained by the scholars of the École Centrale des Arts et Manufactures. ASSOCIATION Amicale.
—— Electricity at. VIVAREZ (H.), 1890.
—— Iron and Steel. BRESSON, 1889; COMITÉ des Forges, 1889.
—— Mathematical Sciences. Congress on Bibliography. PARIS, p. 458.
—— Mechanics (Applied). Congress. PARIS, p. 458.
—— Minerals. Catalogue. PARIS, p. 458.
—— Mineralogical Collection of Chili. PARIS, p. 458.
—— Mines and Metallurgy Congress. PARIS, p. 458.
—— Photography Congress. PARIS, p. 458.
—— "Ponts et Chaussées," Models, etc. PARIS, p. 459.
—— Railways of the State. PARIS, p. 458.
—— Railway of the East. PARIS, p. 458.
—— —— Decauville Railway. DECAUVILLE.
—— —— Notices on the types of locomotives and carriages shown there. SOCIÉTÉ des Chemins de Fer Italiens, etc., 1889.
—— Steam, accessory apparatus used in the production and employment of. NOVINCE, 1892.
—— Water. International Congress on the Utilisation of Waters. BOULÉ, 1889; JACQUELIN.
—— Workman's Dwellings. ROULLIET (A.), 1889.
—— Argentine Section. PARIS, p. 458.
—— British Section. Report of Executive Council, 1890. PARIS, p. 459.
Paris and London. Comparative merits of the Exhibitions. FAIRBAIRN (Sir W.), 1866, pp. 403.

EXHIBITIONS (PLACES)—*continued.*

Philadelphian Centennial Exhibition of 1876. Reports, etc. PHILADELPHIA (1876), p. 33; REULEAUX, 1877.

—— Masterpieces of. Vol. 3. History, Mechanics, Science. WILSON (Joseph M.).

—— Remarkable Public Works shown at. WATSON (William), Ph.D.

—— Report on Architecture and Engineering. HAWKSHAW.

—— Report on Lighthouse Engineering. BARNARD (J. G.), 1879.

San Francisco Industrial Exhibitions. Reports, 1872–91. SAN FRANCISCO.

Swiss National Exhibition, 1883. Official Guide. WALDNER (A.).

Sydney Intercolonial Exhibition of 1870. The Industrial Progress of New South Wales. SYDNEY, 1871, p. 244.

—— Australian, 1882. Report of the Royal Commission. SYDNEY, 1882, p. 274.

—— Scientific and Mechanical Exhibition to be held in 1886. Prospectus and Regulations. SYDNEY, p. 274.

Trieste. Austrio-Hungarian, for Industry and Agriculture. BOEHMCHES, 1882.

Vienna. Universal Exhibition, 1873. DENAMIEL, 1873; MAW and Dredge, 1874; VIENNA.

—— Reports of the Commissioner of the United States. VIENNA, 1876.

—— Locomotives. DEGHILAGE and Morandière.

—— Machines. FONTAINE.

—— Marine and Maritime Works. FRIEDMANN, 1874.

—— Mineral Industry. GRUNER (L.), 1874.

—— Mines and Metallurgy. HABETS, 1875.

—— Ordnance and Marine Material. KIRKLAND (W. A.), 1874.

—— Designs, models, and works relative to "ponts et chaussées," mines, etc. Reports, etc. VIENNA, 1873, 1874.

—— Empire of Brazil at. VIENNA, 1873.

—— Exhibition, 1888. VIENNA.

EXPLOSIONS.

"Aberdeen," Explosion on board the steamer, 1884. ABERDEEN.

Accidental Explosions. ABEL (Sir F. A.), 1875. Produced by non-explosive liquids. ABEL (Sir F. A.), 1885.

Armstrong's Wherry "Fanny," on the Tyne. Report on an Explosion during the illegal manufacture of Quick-firing Ammunition on. TYNE River, 1890.

Boilers. *See* STEAM BOILERS (Explosions).

Bournemouth, Explosion on board a steamer off. BOURNEMOUTH, 1884

EXPLOSIONS—*continued.*

Castleton, near Manchester; explosion on Mr. Riley's premises. CASTLETON, 1882.
Coal Mines. *See* COAL MINES (Explosions in).
Cornbrook, fire and explosion, 1887. CORNBROOK, 1887.
Crarae Quarry, Loch Fyne, 1887. CRARAE.
"Doterel" Explosion. Origin of the loss of H.M.S. "Doterel" examined. ROWAN (T.), 1883.
Dynamite explosion at Burnbank, Glasgow, 1876. BURNBANK.
—— Cymmer, Glamorganshire. CYMMER, 1876.
—— Halkyn. HALKYN, 1878.
—— Mancetter Bridge Quarry, Warwickshire. MANCETTER.
—— Nantymwyn Lead Mine, Gelatine Dynamite at, 1892. NANTYMWYN.
—— "Parallel," Cargo on board the schooner. LE CONTE, 1887.
—— Sutton Harbour, Dec. 13, 1893. PLYMOUTH.
Edenburn, Nov. 28, 1884. EDENBURN.
"Elbe," s.s., on board the Royal Mail Steam Packet Company's, 1887. PARKER (Wm.).
Festiniog Tunnel. FESTINIOG, 1877.
Fireworks. Birmingham; explosion at a small Fireworks Factory. BIRMINGHAM, 1881.
—— Brock and Co.'s Firework Factory Explosions, 1881, March and August, 1893. NORWOOD (South).
—— Coseley, Staffs., Firework Factory at. COSELEY, 1893.
—— Dublin. Explosion at Hodsman's Firework Factory, 1887. DUBLIN.
—— Dyer and Robson's Factory, Greenwich, 1887. Report. GREENWICH Marshes.
—— Mitcham. Pain's Firework Factory, 1885, '89, '90. Reports. MITCHAM.
—— Norwich, Fireworks at. Report, 1876. NORWICH.
—— Wisbech Firework Factory. Report on Explosion at, 1884. WISBECH.
Flour-mill Fire-explosions. MACADAM, 1874.
Fog Signals at Dyer and Robson's Factory, Greenwich, 1882. GREENWICH Marshes.
Fulminate of Mercury at Hincks' Chemical Works, Small Heath, 1876. HINCKS' Chemical Works.
Furnace near Inverary, 1884. FURNACE.
Iron Furnaces. Report on Explosion, Askham. ASKHAM, 1882.
Gas Explosion at Tottenham Court Road, 1880. LONDON, p. 260.
—— At Valley Road Gasworks of the Bradford Corporation. Report to the Coroner. WAUGH (J.), 1893.

EXPLOSIONS—*continued.*

Glasgow. Report on three explosions, 1883. GLASGOW.

Greenock, James Watt Dock. GREENOCK, 1884.

Gun Cotton. Stowmarket, Explosion of Gun-cotton at, 1872. STOWMARKET.

Gunpowder, Ardeer. Report on an explosion at a Cartridge Hut. ARDEER, 1884.

—— Auchmontain, Report on the Explosion of Gunpowder on board the sailing barque. AUCHMONTAIN, 1893.

—— Barwick. Drying house at the Factory of the Smokeless Powder Company at. BARWICK, 1893.

—— Bassinghyll Gunpowder Mills. Report on an explosion. BASSINGHYLL, 1883.

—— Bedford, Gunpowder at. BEDFORD, 1877.

—— Blackbeck, Lancashire, Gunpowder. BLACKBECK, 1881, 1884.

—— Chilworth Gunpowder Factory. CHILWORTH, 1879, 1884.

—— Cradley Heath, Staffs., 1887, explosion at. CRADLEY HEATH, 1887.

—— Dartford, 1879, Gunpowder at. DARTFORD.

—— Gunpowder factory at Dartford, 1885. DARTFORD.

—— Doncaster Gunpowder Explosion, 1880. DONCASTER.

—— Eastwood. J. Hall and Son's Cartridge Factory, explosion of Gunpowder and Blasting Cartridges, 1881. EASTWOOD, 1881.

—— Elterwater near Ambleside, Gunpowder Factory at. ELTERWATER, 1878.

—— Faversham Detonator Factory. FAVERSHAM, 1878, '79.

—— —— Glazing house at Faversham Marsh. FAVERSHAM, 1879.

—— —— Hall and Son's Gunpowder Factory. FAVERSHAM, 1881.

—— Fernilee, Gunpowder and Blasting Cartridges at Factory of Messrs. Williamson and Co. at. FERNILEE, 1888.

—— Gatebeck near Kendal, July 1881, explosion at. GATEBECK.

—— Herodsfoot Gunpowder Factory, Liskeard 1877, explosion at the. HERODSFOOT.

—— Hose Tunnel, explosion in. HOSE Tunnel, 1876.

—— Hounslow Gunpowder Factor of Curtis and Harvey, 1887. HOUNSLOW.

—— Kennall Vale Gunpowder Factory, 1887. Report. KENNALL VALE.

—— Lowwood Gunpowder Works. Explosion, 1887. LOWWOOD.

—— New Sedgwick Gunpowder Co. Report of an explosion at their factory on April 12, 1883. SEDGWICK, 1883.

—— Pentre Broughton, Gunpowder, 1879. PENTRE BROUGHTON.

EXPLOSIONS—*continued.*

Gunpowder. Regent's Park, 1874, Explosion in the. REGENT'S Park.

—— Roslin Gunpowder mills, near Edinburgh, Explosions at the, on the 9th July, 1885, in 1890, and 17 Sept. 1892. Reports. ROSLIN, 1885–1892.

—— Waltham Abbey Royal Gunpowder Factory. Report on accident, Dec. 13, '93, and on the danger of Buildings at Waltham Abbey and Woolwich Arsenal. WALTHAM ABBEY, 1894. Explosion of Cap Composition at Joyce and Co.'s factory on Dec. 22, '93. Report on. WALTHAM Abbey, 1894.

—— Wetteren. CHANDELON, 1889.

—— Witton. Explosion at the factory of Messrs. Kynoch and Co., 1886. BIRMINGHAM.

—— —— Kynoch's factory. Report on explosion on Aug. 10th, 1888, during the emptying of shells for quick-firing ammunition at. WITTON, 1888.

—— —— Percussion Caps. Explosion at Messrs. Kynoch and Co. Report on. WITTON, 1888.

—— Worsborough Dale Gunpowder Factory. Report of an explosion at, on the 15th Oct., 1884. WORSBOROUGH Dale.

Hull Botanic Gardens, 1882. HULL.

King's Bridge, Devon. Explosion at the house of Mr. J. Balkwill, Chemist, 1884. KINGSBRIDGE.

Larne, circumstances attending an explosion at, 1885. LARNE.

London. Explosion at the Local Government Board Office, Whitehall, and "Times" Office. Report on. WHITEHALL, 1883.

—— Scotland Yard, etc., Explosions. Report. SCOTLAND Yard, 1884.

—— Railways. Victoria Station explosion, 1884. LONDON, p. 260.

—— Underground Railway, two explosions, 1883. LONDON, p. 260.

Mines and Mills. HEINZERLING, 1881.

New York Harbour, destruction of Flood Rock. ABBOT (H. L.), 1885.

—— Explosions, Hallet's Point. ABBOT (H. L.), 1876.

—— Hell Gate (Halletts Point), Destruction of Reef, 1877. HELL GATE.

Nitro-Glycerine Factory, Waltham Abbey. Report on an Explosion on 7th May, '94, at. WALTHAM Abbey, 1894.

—— Explosion at Craig near Montrose, 1880. CRAIG, Forfarshire.

Nobel's Explosives Co. Report on an Explosion which occurred in the Factory of, Ardeer, 1882. ARDEER.

Pembrey Burrows. Report on two explosions at the Factory of the Explosives Company, 1883. PEMBREY BURROWS.

EXPLOSIONS—*continued.*

Rocket (War) Factory, Gravesend. GRAVESEND, 1878.

Seaham Explosions 1871 and 1880, and the Pochin Explosion, 1884. Enquiry into their cause. STRATTON (T. H. M.), 1892.

Thames below Gravesend. Destruction by Explosion of a floating magazine moored on. THAMES (River), 1877, 1892, p. 294.

"Thunderer" gun explosion. BRAMWELL, 1879.

Tonite. Report on an Explosion of Tonite or Cotton Powder which took place in the Solent on July 19, 1894. SOLENT. Add. 534.

—— At Uplees Marshes. Report of an explosion of wet tonite. UPLEES Marshes, 1882

Toy Caps, explosion in Cadwell's Factory, Southfields, Wandsworth. SOUTHFIELDS, 1888.

EXPLOSIVE AGENTS. ANONYMOUS, 1892, p. 45; HILL (W. N.), 1875; HODGKINSON (W. R.), 1891. Dictionary, CUNDILL, 1889. Power, BERTHELOT, 1883.

Acts. Guide book to the Explosives Act, 1875. MAJENDIE, 1877.

—— Explosive Substances Act, 1883. Amendment Bill, 1886. PARLIAMENTARY..Papers, p. 478.

Application of Explosive Agents. ABEL (Sir F. A.), 1871.

Applied to Industry. ABEL (Sir F. A.), 1881.

Developments in high explosives. NURSEY, 1889.

Explosives Committee of the Royal Cornwall Polytechnic Society, etc. ROYAL Cornwall Polytechnic Soc., 1880.

Explosive Compounds. BEVAN (G. P.), Industries (vol. 2); for use in Tunneling. DRINKER (H. S.), 1893. Add. 497.

Explosives Inspector's Report to the Minister of Mines, 1882. Victoria. VICTORIA, p. 375.

Flameless Explosives Committee of the North of England Institute of Mining Engineers. Report of the proceedings. NORTH OF ENGLAND Institute, 1894. Add. 524.

Improvements in Explosive Compounds. NURSEY, 1871.

Keeping of Explosives for Private use and not for sale. Order in Council, 1883. PARLIAMENTARY..Papers, p. 478.

Mechanical work of Explosives. RZIHA, 1886.

Mining Powder, extra strong. CURTIS and Harvey, 1874–79.

—— Application of Explosives in Mining. DARLINGTON (J.), 1879.

Mixed Explosives. Orders in Council relating to Stores, 1875. PARLIAMENTARY..Papers, 1883, p. 477.

Modern Explosives. CHALON, 1886.

Reports of Committee, 1870–81. PARLIAMENTARY..Papers, p. 477.

—— Select Committee on Explosive Substances. Report, 1874. PARLIAMENTARY..Papers, p. 477.

EXPLOSIVE AGENTS—*continued.*

Reports of Inspector of Explosives, 1876, etc. PARLIAMENTARY..Papers, p. 477.
Smokeless Explosives. ABEL (Sir F. A.), 1890.
War. High Explosives used in. ABBOT (H. L.), 1886.

EXPLOSIVE AGENTS (PARTICULAR).

Coal Dust an Explosive Agent. STUART (D. M. D.), 1894.
Dynamite in its sanitary aspect. HUDSON (R. S.), 1873.
Dynamite or Nobel's safety blasting powder. DOWNIE, 1873.
—— Applications to Military Act. BARBE (P.), 1872.
Dynamite and Nitro-glycerine. CHAMPION (P.), 1872.
Dynamite. Manufacture. SOCIÉTÉ Générale pour la fabrication, etc., 1878.
—— In France. FRANCE, p. 436.
Gun Cotton for Blasting Purposes. LOVELL, 1864.
—— Report and Proceedings of Committee, 1864–68. PARLIAMENTARY..Papers, p. 477.
—— Use for mining and quarrying purposes. Reports, 1869. PARLIAMENTARY..Papers, p. 477.
Gunpowder. ANTONI, 1789; BRADDOCK, 1832; DUHAMEL, 1750 (1846).
—— Determination of force. ROBINS (B.), 1742, 1805.
—— Manufacture. BADDELEY (F.), 1857; LUCKHARDT, 1886; SMITH (Capt. F. M.), 1870.
—— Explosion of gunpowder by Electricity. WHEATSTONE and Abel, 1861.
—— Bengal. Manufacture at the Ishapore Mills. ANDERSON (Col. W.), 1862.
—— Gunpowder and Gun Cotton. Notes on. WARDELL (W. H.), 1878 and '83.
—— Gunpowder, Explosives and fireworks. UPMANN (J.) and Meyer, 1878.
—— Gunpowder and saltpetre manufacture. STEERK (Major), 1866.
—— Gunpowder Factory. Machinery and Apparatus. HAY (J. A. C.), 1877.
—— Fired Gunpowder. NOBLE and Abel, 1875.
—— Recent Inventions in Gunpowder and other explosives. DEERING, 1889.
—— Report of Inspector of Gunpowder Works, 1875. PARLIAMENTARY..Papers, p. 477.
—— Notes on Gunpowder and Gun Cotton, 1878. PARLIAMENTARY..Papers, p. 477.
—— Use in Slate or Ironstone Mines, 1881. PARLIAMENTARY..Papers, p. 477.

EXPLOSIVE AGENTS (PARTICULAR)—*continued.*

Gunpowder. Smokeless Powder and its influence on gun construction. LONGRIDGE, 1890.

—— Smokeless powder and modern guns. RIGG (A.) and Garvie, 1892.

Melinite, truth on. TURPIN (E.), 1890.

Nitro-Benzole and Di-Nitro-Benzole. Risks of Manufacture, 1892. PARLIAMENTARY. . Papers, p. 478.

Nitro-glycerine and Dynamite. BRÜLL, 1875; EISSLER, 1884.

Rackarock. ABBOT (H. L.), 1886.

EXPORTS. *See* IMPORTS and Exports.

EYE. Change in the state of an eye affected with a malformation. AIRY (Sir G. B.), 1846, p. 18.

F.

FACTORIES.

Factories. Their sanitary arrangements. RITCHIE (R.), 1844.

Factories, Mines and Industrial Undertakings, depreciation of, and their valuation. MATHESON, 1884, '93.

Factories, Workshops and Warehouses: their sanitary and fire resisting arrangements. THWAITE (B. H.), 1882, p. 312.

Factory Accounts, principles and practice. GARCKE and Fells, 1887.

Factory and Workshop Act, 1878. REDGRAVE, 1885.

—— Acts to amend Law relating to Factories and Workshops, 1878, '83. PARLIAMENTARY..Papers, p. 478.

Facts for Factories: Letters based on experiences in Bombay. WALKER (W.), 1857.

Means of Transport in factories, etc. EVRARD, 1872.

Reports of the Inspectors of Factories, 1833–79. PARLIAMENTARY..Papers, p. 478.

Steam power, public security by means of the "embrayage électrique." ACHARD (A.), 1861, '62.

Great Britain's Factory System. Exposition of its scientific, moral and commercial economy. URE (A.), 1861.

Turgan. DECAUVILLE, 1892. Add. 496.

United States Factory System. Report on. WRIGHT (C. D.).

FAMINES AND DROUGHTS.

How to avert or mitigate. GOSLIN, 1878.

India. MURRAY (A. G.), 1877.

—— Famine and other Indian Topics. THOMAS (E. C. G.), 1877.

—— Western and Southern India threatened famine, 1877–78. INDIA, p. 101.

—— Hyderabad. Famine Relief Works in the Nizam's Dominions, 1876–77. INDIA, p. 120.

FARMING. National Convention of Farmers and Gardeners. Proceedings, 1845. NATIONAL Convention.

FENIANISM. Two letters on Fenianism. ANONYMOUS, 1866, p. 58.

FERMENTATION. *See* DISTILLATION.

FERRIES.

Boat "Bergen," Experiments made on the Double Screw Steel Ferry Boat. ISHERWOOD, 1890.

Compound Ferry or Ferry Bridge. STOCKMAN (B. P.), 1882.

Rolling Stock Ferries of the World. Report on. HAUGHTON (W. R.), 1894. Add. 506.

Alloa ferry, proposed steam-boat. BALD (R.), 1822.

Dundee Ferries Committee of Management. Observations by Stevenson on Telford's Plan. WARREN (Capt.), 1820.

Fife and Forfar communication improved by means of ferries. STEVENSON (R.), 1818.

Indus Valley State Railway Ferry over the River Indus at Sukkur. ROBERTSON (F. E.), 1884.

Isle of Wight Ferry Bill, 1859. Report of J. G. C. Curtis on. WIGHT, Isle of.

Queensferry Passage, Memorial to the Trustees of the. M'KONOCHIE, 1828.

Tay River Ferries. Statement on the Bill for improving them. TAY (River), 1822.

Usk. Report on the establishment of Ferries across. VERNON HARCOURT (L. F.), 1889.

Woolwich. Act for a ferry across the Thames at, 1811. WOOLWICH.

FESTIVALS. Brean Down. BREAN DOWN, 1889.

FIBRES.

Botanical sources. CHRISTY (T.), 1882.

Fibres and Cordage. BEVAN (G. P.). Industries, vol. 9.

Phormium Tenax as a fibrous plant, 1889. NEW ZEALAND, p. 409.

FILTRATION.

Comparative trials of Water filtration at the Army Medical School. FRANÇOIS de Chaumont, 1880.

Improvements in Filter Presses. CLARK (D. K.), 1887.

Maurra's Patent Filter. A letter on the filtration of water on a large scale. SLOPER (B. G.), 1844.

Mechanical Filtration. COLCOCK, 1887.

Production of pure water by Filtration. PIEFKE, 1887.

Public Filtration. FONVIELLE, 1839.

Report of M. Arago. ARAGO (F.), 1837.

Sand Filtration. GRAHN and Meyer, 1877; KÜMMEL, 1893.

Hamburg. GILL (H.) and Fölsch, 1881.

Toulon. On board the 'Thétis' frigate. FRANCE, p. 440.

Toulouse, natural filters of. DUPUIT, 1854.

See also WATER Analyses.

FINANCE.

Budgets and Accounts of England and France. BALFOUR (G.), 1866.

Bullion Question. GILBERT (D.), 1819.

Corporation of Foreign Bondholders. CORPORATION, 1874–79.

Depreciation of Silver, causes and remedy. MOLESWORTH, 1886.

Divorce of Silver and Gold. MOLESWORTH, 1891.

Financial Reform. BENTHAM, 1830.

Law of Bills of Exchange, Promissory Notes, bank notes, bankers' notes, drafts and checks. MANNING (E. W.), 1817.

Modern Cambist, forming a manual of Foreign Exchanges, in the different operations of bills of exchange and bullion, etc. TATE (W.), 1889.

Monetary Union of France, Italy, Belgium and Switzerland. (Latin Münzverein). PARIEU, 1866.

Payment of Interest out of Capital during construction of Works. GUTHRIE (E.), 1886; PEASE (Sir J. W.), 1885.

Proposal to reduce the quantity of fine gold in the sovereign. MACLAREN, 1869.

Registration of Transfers of Stocks, Shares, and Securities. ENNIS, 1893.

Silver question. MOLESWORTH, 1886.

Standard of Value and Circulating Medium of the Country. HAGGARD (W. D.) 1847.

Tables of Exchange between Paris, Bordeaux, Marseilles, Brussels, Genoa, and London, being French money reduced into English, and English money reduced in French. LAURIE, 1845.

Thoughts on Finance. LAUDERDALE, 1797.

Universal Exchange Tables. LAURIE, 1852.

What is Money? GRANIER, 1892.

Working of Foreign and Colonial Exchanges of Gold and Silver. NORMAN (J. H.), 1891.

American, British, and foreign securities. Official intelligence for 1882, etc. BURDETT, 1862.

Australia, Western. Estimates of Revenue and Expenditure for the year 1872. WESTERN Australia, 1871.

Belgium. Budget of receipts and expenses of the kingdom of Belgium. BELGIUM, 1841, p. 116.

Canada. Budget Speech, May 12, '87. TUPPER (Sir C.), 1887.

Costa Rica. Proposed settlement of the external debt of the Republic. COSTA RICA.

Great Britain. Available gold Reserves for the British Isles. NORMAN (J. H.), 1891.

—— Fallacy of our Monetary System. ENDERBY, 1847

FINANCE—*continued.*

Great Britain. Money Laws. The cause of the National Distress. ENDERBY, 1847.
—— National Debt. HIBBARD, 1793.
—— National Debt and Sinking Fund. ANONYMOUS, 1856, p. 47.
—— Present pecuniary panic. SANKEY (W. H. V.), 1866.
—— Reports of Committees on Public Income and Expenditure, 1786–91. Finance Reports, 1798–1803. PARLIAMENTARY. . Papers, p. 478.
India. Finance and Revenue Account, 1884–7. INDIA, p. 101.
—— Revenue and Expenditure, 1862–80, 1869–85. INDIA, p. 101.
—— Report of Financial Report, Madras, 1860. INDIA, p. 122.
New South Wales. Financial Statement of Colonial Treasurer. NEW SOUTH WALES, 1875–79, p. 401.
—— Public Accounts for 1889. NEW SOUTH WALES, p. 401.
—— Financial Statement of the Colonial Treasurer. NEW SOUTH WALES, 1877. Add. 522.
New York State. Report, 1872. NEW YORK STATE.
New Zealand. Statements by Colonial Treasurer, 1870–87. NEW ZEALAND, p. 410.
—— Payments to Provinces Act, 1871. NEW ZEALAND, p. 410.
Paris. Budget for 1866, 1883–84. PARIS, p. 460.
Turkey. Reformation of Turkish Finance. LOW (W.) and Thomas, 1876.
United States. Financial and political condition of. HAZARD (R. G.), 1864.
—— Finance. UNITED States, p. 347.
—— Monetary Commission. UNITED States, p. 347.

See also BANKS and Banking; CURRENCY.

FINE ARTS. *See* ARTS (Fine).

FIRE-ARMS.

History and science of. DEANE (J.), 1858.
Selection and management. SILVER (S. W.) & Co., 1872.
Treatise on Fire-arms. ANTONI, 1789.
Breechloading, Specification of Improvements in. BODMER (J. G.), 1813.
Breech-loading Rifles. Photographs. TUPPER (A. C.), 1870.
Breech-loading Infantry Rifles produced since the adoption of the Snider breech-loading principle. Returns, 1870. PARLIAMENTARY. . Papers, p. 493.
Colt's Pistols, Report on. SHIELDS, 1851.

FIRE-ARMS—*continued.*

Colt's Pistols. Armsmear, the home, the arm and the armory of S. Colt. COLT, 1866.

—— Application of Machinery to the Manufacture of rotating chambered-breech Fire-arms. COLT, 1854, 1855.

—— Patents for Repeating Fire-arms previous to 1851. COLT.

—— Repeating Pistols. Invented by Colonel Colt and other inventors. COLT, 1851.

Gun-flints. Manufacture. GEOLOGICAL Survey, 1879; SKETCHLEY (S. B. L.), 1879.

Manufacture of Fire-arms and Ammunition. FITCH, 1882.

Martini-Henry breech-loading rifles. Reports, 1871, '76. PARLIAMENTARY..Papers, p. 493.

Martini-Henry arms. Reports, 1870. PARLIAMENTARY..Papers, p. 493.

—— Reports of two battalions of infantry who have had them in use, 1874. PARLIAMENTARY..Papers, p. 493.

Rifled Infantry Arms. A description of the modern system of small arms. SCHÖN (J.), 1861.

Rifled Small Arms. WHITWORTH (Sir J.) 1882.

Small bore rifles. Report of Committee, 1863. PARLIAMENTARY..Papers, p. 492.

Sporting arms. GREENER, 1858.

Use and construction of. GREENER, 1841.

Various small fire-arms. GREENER, 1835.

Weapons for the chase. ROUX (L.), 1869.

FIRE DAMP. *See* COAL MINES.

FIRE-GRATES.

Improved fire-grate. BODMER (J. G.), 1860.

Lighting fires from the top, Economy of. BARLOW (P. W.), 1882.

Smoking Fires, their cause and cure. AINSLIE, 1869.

Utilisation of Waste from Open fire-places. EDWARDS (F.), jun., 1868

FIRE INSURANCE. *See* INSURANCE.

FIRE-PROOF BUILDINGS.

Construction. BARRETT (J.), 1853; BARTHOLOMEW (A.), 1839; FAIRBAIRN (Sir W.), 1844, p. 403.

Construction of Public buildings and dwelling houses. FOX and Barrett, 1849.

Examples of one-storey Slow-burning Constructions. BOSTON Manufacturers, 1890. Add. 486.

Fire-proof and thief-proof depositories. PRICE (G.), 1856.

FIRE-PROOF BUILDINGS—*continued.*

Fire-proof floors. LAWFORD (G. M.), 1889.

Fire-proof flooring. CUNNINGTON (T. C.), 1889.

Houses. Essay on the erection of Fire-proof Houses, in flats. ASHPITEL and Whichcord, 1855.

Incombustible Constructions such as buildings, bridges, etc. Complete patented system of. TARTE (X.) and Toovey, 1860.

FIRES, FIRE-ENGINES, ETC.

Alarms, Telegraphic Fire. ROGERS (H. B.), 1851.

Automatic Extinction. Apparatus for the Automatic Extinction of Fires. LYNDE, 1886.

Berlin. Description of the steam fire-engine made by Braithwaite & Co. WEDDING, [1840].

Detection. Pyrakodon or Fire detecter. FOOTE (R.). App. 557.

Escape from buildings in case of Fire. BAILLAIRGÉ, 1887.

Fire-engines and apparatus, Construction of. BACH, 1883; BRAIDWOOD, 1880.

—— Application of manual power to the working of. BRAIDWOOD, 1844.

—— Extinguishing Fires by Explosion and Suffocation, Method of. GODFREY, 1724.

—— Steam Fire Engines. ROPER (S.), 1876. Competitive Trials. ANONYMOUS, 1862, p. 53.

—— Dick's Chemical fire-engine "L'Extincteur." SINCLAIR (J.), 1872.

—— Specifications for a portable combined Pumping and Fire Engine, 1877. SOUTHWARK and Vauxhall.

Inquests. City of London Fire Inquests Act, 1888. LONDON, p. 260.

London Fire Brigade and Late Fire Engine Establishment. SHAW (Sir E. M.), 1870, 1876, 1890.

Metropolitan Fire Brigade. Reports, 1868–1888. Report from Select Committee, 1876. Report on Conclusions arrived at by Select Committee, 1877. LONDON, p. 260.

Mills, Fire Protection of, and construction of Mill floors. WOODBURY (C. J. H.), 1882.

Preservation of Life and Property. HEATHMAN, 1882.

Prevention of Fires. ATTFIELD, 1872; LONDON, p. 260. Of calamitous fires. DUDLEY (S. B. W.), 1828. Fire prevention and fire extinction. BRAIDWOOD, 1866.

—— Fire Surveys, or a summary of the principles to be observed in estimating the risk of buildings. SHAW (Sir E. M.), 1876.

FIRES, FIRE-ENGINES, ETC.—*continued.*

Prevention of Fires. Hints for preventing damage by, in the construction and warming of buildings.
BEAUMONT (A.), 1835.

—— Means of preventing the loss of life and property by Fire.
KEATING, 1883.

—— Method of reducing Fire and loss.
WOODBURY (C. J. H.), 1890.

Protection (Fire). Report of Select Committee, 1867.
PARLIAMENTARY..Papers, p. 478.

Steam, use of, to extinguish fires in factories and steamboats.
COLLADON, 1840.

Theatres. Fires in Theatres. SHAW (Sir E. M.), 1876, 1889; TRÉLAT (E.), 1887.

—— Theatre Fire Catastrophes and their prevention.
GERHARD (W. P.), 1894. Add. 502.

—— Exeter. Theatre Royal. Fire, September 5, 1887. Report and Reply. EXETER, 1888.

Water. Fire-stream Tables. FREEMAN, 1889.

—— New experiments and tables. FREEMAN, 1890.

—— Hydraulics of Fire-streams. FREEMAN, 1889.

—— Work done by and required for Fire Streams.
ELLIS (G. A.), 1878.

—— Best means of providing an efficient supply of Water.
LONDON, p. 260.

—— Defective supply of Water, 1824, '77. LONDON, p. 260.

—— Metropolitan Water Supply for Fires, 1876. LONDON, p. 260.

—— Means of rendering large supplies of water available in cases of Fire. BRAIDWOOD, 1844.

—— Nozzle (The) as an accurate water meter. FREEMAN, 1891.

—— Report on the best means of providing an efficient supply of water for extinguishing fires, etc., 1877.
LONDON, p. 273.

—— Report on Water jets for extinguishing Fires, 1877.
LONDON, p. 273.

—— Water jets for extinguishing Fires. LONDON, p. 260.

See also HYDRANTS.

FIREWORKS.

Accident at a display at Batley. BATLEY, 1887.

Burning of fireworks in Hanley, 6 March, 1882. HANLEY.

Dissociation Temperatures, with special reference to Pyrotechnical questions. SIEMENS (F.), 1886.

Firework Factory at Barton Moss, near Manchester.
BARTON MOSS, 1893.

Fireworks Manufacture. STEERK (Major), 1866.

FISH. The Flying Fish. GALLOWAY (W.), 1891.

FISH SUPPLY.

London. Fish markets. Fish trade abuses. Fish frauds and adulterations. LAWRENCE-HAMILTON, 1890.

—— Scheme for a Central Fish Market for London. CAYLEY, Boyes, and Bridgman, 1881.

FISHERIES.

Establishment of fisheries. KELLER (H.), 1885.

Belgium. Restocking of Belgian Waters. CLERCQ, 1881.

Belgium and England. STAHL (B.), 1890.

British. Reports, 1785–1801. PARLIAMENTARY..Papers, p. 478.

—— Fisheries and Fish Markets of Great Britain. DEMPSTER, 1874.

—— National Fish Culture Association Journal, 1867. NATIONAL Fish Culture.

French fisheries, and the condition of the Fishing Industry. WALLEM (F. M.), 1880.

Ireland. Bill to amend Fishery Act, 1888. IRELAND, p. 140.

—— Deep-sea and Coast Fisheries of Ireland. BRABAZON, 1848.

—— Report of Commission, 1836. IRELAND, p. 141.

New South Wales. OLIVER (A.), 1871.

—— Report on Working of the Fisheries Act, 1889. Report of Commissioners, 1888. NEW SOUTH WALES, p. 401.

Scotland Fishery Board Annual Reports. SCOTLAND, 1883, p. 174.

—— Returns. SCOTLAND, 1888, p. 174.

—— New branding regulations on the Continent. Report of the deputation from the Fishery Board for Scotland. SCOTLAND, 1891, p. 174.

—— Trawling regulations in Scotland. Report. SCOTLAND, 1888, p. 174.

Severn Fishery District. Appendices XII. and XIV. of the 21st annual Report of the Board, 1888. SEVERN (River).

Thames, Medway, etc. Rules, orders, ordinances, etc., for fishing in. THAMES (River), 1800, 1846, p. 294.

Tweed Fisheries Acts. Report on. TWEED River, 1875.

United States Commission of Fish and Fisheries. Report of the Commissioner for 1883. p. 348.

Herring. Dutch pamphlets, 1858. PARLIAMENTARY..Papers, p. 470.

—— Scotch-cured Herrings and other fish. Reports on the best means of increasing the demand for them in foreign countries. SCOTLAND, 1888, p. 174.

Mussel beds in tidal waters and Drying grounds for fishermen's nets in Scotland. Reports. SCOTLAND, 1887, p. 174.

FISHERIES—*continued.*

Oyster. Convention between the Queen and the King of the French, 1839. PARLIAMENTARY..Papers, p. 478.

—— Report from Select Committee 1876. PARLIAMENTARY..Papers, p. 478.

Salmon, England and Wales. Report of Commissioners. PARLIAMENTARY..Papers, p. 478.

—— Salmon Fisheries, Scotland. Report. SCOTLAND, 1871, p. 174.

Whale Fishery Company, Southern. Reports. PRESTON (T. R.), 1850.

FIXTURES, Law of. GIBBONS (D.), 1836.

FLAMES.

Light of. SIEMENS (Werner von), 1883.

Relation betwixt Flame and Air. ANONYMOUS, 1704, p. 49.

Sensitive Flames, as illustrative of Sympathetic Vibration. BARRETT (W. F.), 1879. New sensitive flames. DECHARME, 1875.

Transparence of Flames. ALLARD (E.), 1875.

FLASHLIGHTS, and the physiological perception of instantaneous flashes. BLONDEL, 1893.

FLAX. BROTHERTON, 1857; CAMPBELL (F.), 1845.

Flax and linen. BEVAN (G. P.). Industries, vol. 5.

Flax and its products in Ireland. CHARLEY, 1862.

Punjab. Flax operations, 1855. INDIA, p. 129.

United States. Flax Culture. UNITED States, 1890–2, p. 348.

FLOATING BODIES. Dynamical stability and oscillations. MOSELEY, 1850.

FLOODS.

Causes and effects. VALLÉS (F.), 1857. Causes and remedy. DUMAS (J.), 1857.

Laws, causes and effects. BASTELICA, 1874.

Legislation respecting Water, from the point of view of Inundations. MONESTIER-SAVIGNAT, 1858.

Prevention of Floods. BLAKE, 1881; FABRE, 1797; KLUNZINGER (P.), 1882, '86.

—— Means of prevention. DUPUIT, 1858.

—— Flooding of Rivers and formation of Conservancy Boards. DAWBARN, 1878.

—— Protection of plains from inundations. COMOY, 1861.

Prevention of Floods Bill, 1883. PARLIAMENTARY..Papers. Add. 527.

FLOODS—*continued.*

Prevention of Floods. Decrease in the water in springs, rivers, etc., contemporaneous with increase in height of floods in cultivated countries. WEX (G. von), 1873, '80.

—— Effect of Reforesting mountains, hills and upland. COOPER (R. T.), 1886; THIÉRY (E.), 1891.

—— Is the destruction of Forests a cause for their increase? ROBERTS (T. P.), 1884.

—— System contrived by foresters and engineers. BRETON, 1873.

—— Works of defence against Floods. COMOY, 1868.

Stream Regulation in Flood Regions. DALMANN, 1856.

Alps (High), Torrents of the. SURELL (A.), 1870–2.

Campsbourne, Flooding at, 1886. HORNSEY Local Board.

Ceylon. Report of Flood Commission, 1873. INDIA, p. 115.

Clutha, River. CLUTHA, 1880.

Colombo. Flood Outlets, 1877–78–80. INDIA, p. 117.

Elmira, N.Y., Protection of, against Floods. COLLINGWOOD, 1890.

France, South-west. The inundations of 1875: Toulouse, Castelsarrasin, Moissac, Agen, etc. TOULOUSE, 1875.

Gryonne Valley. Report of the inundation in, Sept. 2, 1873, and on the measures taken to prevent its recurrence. GRYONNE (River), 1874. Add. 505.

Indus River, Floods of the. O'CONNELL, 1871.

Irwell Floods, 1866. Report. BATEMAN (J. F. La T.)

—— Report on Floods in the Irwell River. WHITAKER (W. H.), 1881.

Italy. Control and regulation of Floods. Speech in the Italian Senate for the sale of bare uncultivated communal lands situated on Mountains and Hills. TORELLI, 1882.

Loire, River. COMOY, 1861.

Melbourne, 1891. CULCHETH.

Montreal. Reports, 1888, '90. MONTREAL.

New South Wales, Hunter River. Report of Hydraulic Surveyor. HUNTER River, 1877.

New South Wales, Hunter River. Report of G. Gordon. HUNTER River, 1890.

—— Floods in the Hawkesbury River. JOSEPHSON, 1885.

Ouse (Lower). Fen Floods and the Lower Ouse. MOXON (J. H. H.), 1878.

Oxford, Floods around. Their causes, effect, and remedy. VERNON-HARCOURT (L. F.), 1883.

Rome. Proposed Works for the prevention of the inundation of the City of Rome by the overflow of the River Tiber. COLLYER, 1875.

FLOODS—*continued.*

Shannon Floods, extent and causes. BATEMAN (J. F. La T.), 1863.
Somersetshire. Report, 1872–73. GRANTHAM (R.).
Stony Brook, Prevention of Floods in the valley of. FRANCIS, Clarke and Herschel, 1886.
Switzerland, Floods in. Their regulation. SALIS (A. de), 1891.
Taieri River. Reports on Floods. TAIERI River, 1880.
Thames Valley, Floods in the. PALMER (F. I.). 1877.
—— Thames Floods. Report to inquire what amendments are required to deal with the injuries inflicted by. THAMES (River), 1877, p. 295.
—— Thames River (Prevention of Floods) Bill. Reports. THAMES (River), 1877, 1879, p. 295.
Tiber. Causes of, and remedy for floods of the. CHIESA and Gambardini, 1746.
Victoria. River Barwon. KERNOT, 1885.
Yarra River Floods. Report. YARRA River, 1892.
See also INUNDATIONS.

FLOORING.

Improved Patent Wood Block Flooring. LOWE (R.), 1889.
Wood Paving. Its application to the flooring of warehouses. STEVENS (J. L.), 1842.
Wooden and Fireproof floors. MARSH (J. T.), 1878.
Wooden Floors. ANONYMOUS, 1885, p. 58.
Saltaire Dining-Hall Floor. Collapse of, 1889. WAUGH (J.).

FLOUR MILLING. *See* CORN MILLING.

FLOWER POT. New aerating. CLARK (E. H.), 1884.

FLUIDS. Efflux and influx of elastic fluids under variable pressures. FLIEGNER, 1874.
Elevation of. ANONYMOUS, 1824, p. 44.
Equilibrum and Motion of Fluids. WEBSTER (Thomas), Q.C., 1836.
Equilibrum and movement of. ALEMBERT (J. L. d'), 1770.
Fundamental principles which govern the behaviour of fluid with special reference to the resistance of ships. FROUDE (W.), 1876.
Impulsive action of Inelastic fluids. DONALDSON (W.), 1883.
Inquiries concerning the principle of the Lateral Communication of Motion in Fluids. VENTURI (J. B.), 1799.
Mathematical Theory of the Motion of Fluids. LAMBS, 1879.
—— Fluid Motion. Displacement. MAXWELL (J. C.), 1870.
Motion of Fluids in pipes. ANONYMOUS, 1850, p. 51 ; GIRARD, 1817.

FLUIDS—*continued.*

Properties and Motions of Fluids. STANLEY (W. F.), 1881.
Relation between the velocity and the resistance encountered by bodies moving in Fluids. HEPPEL, 1846.
Resistance of Fluids. New theory. ALEMBERT (J. L. d'), 1752.
—— To Bodies passing through them. WALKER (James), 1828, p. 393.
—— Laws. FROUDE (W.), 1879.
Surface of Fluids. HAGEN (G.), 1845.
Theory of Elastic Fluids. LAPLACE, 1821.

FOG.

Inconveniencie of the aer and smoak of London dissipated. EVELYN, 1661.
Nature and Origin of different kinds of dry fog. MARTINS, 1860.
Natural process of dissolution. DULIER, 1892.

London, prevention of fogs. COLWELL, 1892.

FOG SIGNALS.

Coast Fog Signals. BEAZELEY, 1872; STEVENSON (D. A.), 1881.
Correspondence with the Board of Trade, 1875. PARLIAMENTARY..Papers, p. 479.
Fog Signalling. SEOANE, P. P., 1883.
Report by Professor Tyndall to the Trinity House, 1874. PARLIAMENTARY..Papers, p. 479.
Returns of Fog Signals, United Kingdom, 1873, '79. PARLIAMENTARY..Papers, p. 479.
Special Gun and the utilization of Gun-Cotton for Fog Signals. Correspondence and reports in relation to the construction of. TRINITY House, 1876–78.
Steam Whistle. Signals to show the course of steamships in foggy weather by means of. ADAMSON (H. H.), 1894. Add. 479.

Ailsa Craig Fog-signalling Machinery. INGREY, 1886.

FOLK LORE. Hymns of the Nângîpanth. TEMPLE (R. C.), 1884.

FOOD. LETHEBY, 1872; STUTZER, 1894. Reports of Select Committees on the high price of provisions, 1800. PARLIAMENTARY..Papers, p. 497.
Adulteration. Food and Food Adulterants, United States. UNITED States, 1887–93, p. 348.
—— Extent and character of Food Adulterations. WEDDERBURN (A. J.), 1890.

FOOD—*continued.*

Condemned meat, various methods of dealing with. London Report. SAUNDERS (W. S.), 1877.

Preservation. Abstracts of English and colonial patents relating to the Preservation of food. ARCHER (W. H.), 1870.

Preservation of Alimentary Substances. PAULET, 1874.

Products of the Food-producing interior of the United States. McALPINE, 1873.

FORCE.

Apparent lines of, on passing a current through water. ANDREWS (T.), 1875.

Force and Matter. Natural order of the Universe. BÜCHNER, 1881.

Unity of Force. ANONYMOUS, 1862, p. 43.

FORESHORES. Wales and Monmouth Foreshores sold or leased since October, '51. Return of. WALES, 1888.

FORESTS AND FORESTRY.

Collection of works on Forestry. Catalogue. SURVEYORS' Inst., 1894.

Creation, maintenance and enrichment of Forests. MACIVOR, 1870.

Cultivation and Acclimatization of Trees and Plants. LUDLAM, 1865.

Cultivation of Copse, half-grown and full-grown trees. MONCEAU, 1764.

Distribution of Forest Trees. EVERETT, 1866.

Evergreen and Deciduous Trees. LAWES (Sir J. B.), 1851.

Floods. Effect of reforesting of hills and uplands on Floods on rivers. COOPER (R. T.), 1886.

—— Is the destruction of Forests a cause for the increase of Floods? ROBERTS (T. P.), 1884.

—— Reforestation of mountains to prevent floods. THIÉRY (E.), 1891.

Forest Management. KREUTER, 1859.

Forester, The. Treatise on the planting, rearing, and general management of forest trees. BROWN (James), 1871.

Formation and management of young plantations. BLACK (J.), 1855.

Means of preserving woods from damage. BAUMHAUER (E. H. von), 1866. Add. 484.

Method of improving estates by plantations of oak, elm, ash, etc. LANGLEY, 1728.

Oaken Timber planting. ANONYMOUS, 1691. Add. 480.

Organisation and Valuation of Forests on the continental system. MACGREGOR (J. L. L.), 1883.

Submarine Forests on the shores of Liverpool Bay. BOULT (J.), 1865, 1866.

Woods and Forests. Report on destructive insects, 1868. INDIA, p. 109.

FORESTS AND FORESTRY—*continued.*

Woods and Forests. Reports of H.M.'s Representatives abroad on their cultivation, 1884.
PARLIAMENTARY..Papers, p. 521.

America, North. Report. SARGENT (C. S.), 1884.
Australia, Eucalypts of, and the adjoining islands.
MUELLER, 1879–84.
Australia. Notes on the rate of growth of some Australian Trees.
RUSSELL (H. C.), 1892.
—— South, Tree-Culture in. BROWN (J. E.), 1886.
—— —— State Forest Administration. Report.
SOUTH Australia, 1882, p. 230.
Burmah. Reports of Forest Administration, 1861–62, etc.
INDIA, p. 114.
Cambridgeshire and Lincolnshire, Preparation of land for the growth of Timber in. HARRISON (J.), 1770.
Canada. BELL (R.), 1886.
Delamere Forest, Cheshire. Works for reclaiming the late forest.
GRANTHAM (R.), 1864.
Epping Forest. Report. EPPING, 1871.
Europe. Schools of Forestry. BROWN (J. C.), 1877
France. Pine Plantations on the Sand-Wastes of France.
BROWN (J. C.), 1878.
—— French Alps. Planting of trees in the valley of Barcelonnette.
GONIN (L.), 1890.
Great Britain and Ireland, Afforestation in. SCHLICH (W.), 1886.
India. Report on the Attaran Forests, 1861. INDIA, p. 109.
—— Central Provinces. Progress Report, 1864. INDIA, p. 115.
—— Forest Question. COOKE (S.), 1879.
—— Kumaon, 1855. INDIA, p. 122.
—— Madras. Report of Conservator of Forests, 1859–60.
INDIA, p. 123.
—— Pegu Teak, Forests of. Papers and Reports, 1855–62.
INDIA, p. 128.
—— Scinde. Management of Forests, 1853. INDIA, p. 131.
—— Tenasserim and Martaban Provinces. Reports, 1858–59, '59–'60. INDIA, p. 132.
—— Teak Forests of the Tenasserim Provinces. Report, 1852.
INDIA, p. 132.
Italy. Replanting of the Alps, the Cevennes, and the Pyrenees with trees, herbage, and bush. BROWN (J. C.), 1876.
—— Planting of trees on the denuded mountains of Lombardy.
MEGUSCHER, 1847.
Portugal. PORTUGAL, 1868.
Rossendale Forest. NEWBIGGING, 1893.
United States Forestry. UNITED STATES, 1878–93, p. 348.

FORGINGS (LARGE) for Marine purposes, Manufacture of.
CAMERON, 1886.

FORTIFICATION. BORGO, 1777; EMY, 1843; FERGUSSON (J.), 1849; LENDY, 1862; NOIZET-SAINT-PAUL, 1806; PASLEY, 1822; PORTLOCK, 1858.

Attack of Fortresses in the Future. FRASER (T.), 1877.

Attack and defence of places. BOUSMARD, 1797–1804.

Fortification, offensive and defensive. DEIDIER, 1742.

Fortifications, containing the manner of fortifying all sorts of places. VILLE (A. de), 1666.

Fortification and Military Science. Elementary treatise.
VERNON (G. de), 1805.

—— Theory of Field Fortification. MALORTIE de Martemont, 1834.

—— Field Fortifications. PLEYDELL, 1768.

Geometry applied to Fortification. ANONYMOUS, 1885, p. 43.

Iron. Use of iron for Fortifications.
BARNARD (J. G.), etc., 1871–2.

—— Iron Fortifications. INGLIS (T.), 1875.

New system adapted to existing arms. DOULL, 1860.

Permanent forts and movable floating Batteries. BOXER, 1862.

Perpendicular Fortification. ANONYMOUS, 1786, p. 49.

Science of engineers in the management of the works.
BÉLIDOR, 1739, 1789.

Subterranean Fortification. MONZÉ, 1804. Mines offensive and defensive. GILLOT, 1805.

Alexandria. Chasseloup de Laubat's system.
CHASSELOUP de Laubat, 1833.

London. Use of Earthen Fortresses for the defence of London.
PALLISER, 1871.

Paris, Defences of, September, 1870, to January, 1871. Memoir.
VIOLLET-LE-DUC (E. E.), 1871.

Rhine. Modern system adopted for the defence of the Rhine frontier. HUMFREY, 1838.

United Kingdom. Returns, 1861–74.
PARLIAMENTARY..Papers, p. 474.

—— Construction of Fortifications for the defence of Dockyards and Naval Arsenals, 1867.
PARLIAMENTARY..Papers, p. 474.

—— Report of Committee to inquire into construction, condition, and cost of fortifications, 1869.
PARLIAMENTARY..Papers, p. 474.

—— Permanent Fortification for English Engineers. LEWIS, 1890.

—— Richmond's, Duke of, plans. ANONYMOUS, 1794, p. 50.

—— Speeches in the House of Commons.
SAMUDA (Joseph D'A.), 1869.

See DEFENCE (National).

FORTIFICATION—*continued.*

United States Fortifications of To-day. Fire against Models of Coast Batteries and Parados. Horizontal and Curved Fire in Defence of Coast. UNITED STATES, 1883, p. 348.

—— Report of the Board on Fortifications and other Defenses. UNITED STATES, 1886, p. 348.

FORTRESSES.

View Sketches of ground adjacent to a Fortress. LLOYD (E. M.), 1864.

Alessandria, in Italy. ALESSANDRIA.

Ceylon. Memoranda. LAFFAN, 1868.

Coblentz, Fortress of. HUMFREY, 1838.

FOUNDATIONS. BREMECKE, 1887; DOBSON, 1866; MCALPINE, 1868; PATTON, 1893; SLACKE (W. R.), 1875; STREET (W. C.), 1882.

Artificial Foundations and method af Sinking through quicksand. GARFORTH, 1889.

Foundations and Foundation Walls for all classes of buildings. POWELL (G. T.), 1879.

Foundations in Sand. NEWMAN (J.), 1894. Add. 522.

Foundations on treacherous soil. MITCHELL (E.), 1866. Add. 521.

Foundations and Concrete Works. DOBSON, 1867.

Limits of deep foundations. GAUDARD, 1890.

Monolithic Construction of Sea Works under Water by Cement Grouting. KINIPPLE, 1893.

Patent method of protecting Foundations. LOGIN, 1872.

Stone Caissons for Foundations, manufactured in Ransome's patent stone. BUTLER (J. W.), 1871.

Subaqueous Foundations. KINIPPLE, 1890.

Well Foundations. CUNNINGHAM (A.), 1873.

—— Use of Wells in Foundations, as practised by the Natives of the Northern Doab. CAUTLEY, 1839.

Albany, N.Y. New Capitol at. MCALPINE, 1874.

East River Suspension Bridge. Foundations of the Pneumatic Tower. ROEBLING (W.A.), 1873.

Fort Montgomery, application of formula to. MASON, 1850.

FOUNDRIES.

American Foundry Practice. WEST (T. D.), 1883, '88.

—— Methods used for Founding in the Missouri River. CHANUTE and Morison, 1870.

France. GUETTIER, 1882.

Founding, treatise. SPRELSON (N. E.), 1878, '83.

Iron and Steel Founding. LEDEBUR, 1879, '83; WYLIE (C.), 1880, '88.

FOUNTAINS. PRONY, 1816.
Dijon. Public Fountains. DARCY, 1856.
Paris, ancient and modern. MOISY, 1812.
Toulouse, establishment of fountains at. AUBUISSON de Voisins, 1830.

FREEMASONRY. Symbols and Legends. FINLAYSON, 1889.

FREE TRADE.
Anti-Corn Law Conference, Statistical Committee. ANTI-CORN Law.
Cobden's Plaything. GRANDGUILLOT, 1867.
Solution of problems relative to Protection and Free Trade. ANONYMOUS (1860?), p. 56.

FRESCOES. Notre Dame of Paris, mural paintings of the chapels of. VIOLLET-LE-DUC (E. E.), 1870.

FRICTION. CLERK (H.), 1868; HELE-SHAW, 1886; HIRN (G. A.), 1885; JELLETT, 1872; MORIN, 1832–34.
Angle of Friction. HERRMANN, 1882.
Friction and Lubrication. THURSTON (R. H.), 1879, p. 309.
Friction of slipping, specially of rails of railways. BOCHET, 1861.
Loss by Friction in beam and direct action Steam-engines. POLE, 1842.
New theory. PETROFF (N.), 1887.
Treatise on Friction and lost work in Machinery and Millwork. THURSTON (R. H.), 1885, p. 311.
Triumphal Chariot of Friction. POPE (W.), 1829.
Wheel carriages. RANKINE (D.), 1828.
See also LUBRICATION.

FRIENDLY SOCIETIES.
Assurance, Investment, and Emigration. Formation and Management. JAMES (J. H.), 1851.
Friendly Association of Working Lightermen. Articles of Agreement, 1840. FRIENDLY.
Instructions for the establishment of Friendly Societies. ANONYMOUS, 1838, p. 47.
Reform of. EHRENWERTH, 1885.
Suggestions to the promoters and members of Friendly Societies. ANONYMOUS, 1852, p. 56.
Trade Unions, etc. Reports of Registrar, 1878. PARLIAMENTARY..Papers, p. 479.
Treatise on Friendly Societies. ANSELL (C.), 1835.

FRUIT CULTURE.
Fruit Blights and Diseases of Fruit Trees. KIRK (T.), 1889.
United States. UNITED STATES, p. 349.

FUEL. GALLOWAY (R.), 1880; JOLY, 1869; NURSEY, 1865; SIEMENS (Sir W.), 1873, p. 198.
Air as Fuel: or, petroleum, etc., utilized by carburetting air and rendering it inflammable. ROSS (O. C. D.), 1874.
Artificial Fuel, manufacture of. DANVERS, 1869.
Briquette Fuel. DUMBLE (E. T.), 1892. Add. 497; FRANQUOY, 1861.
Calorimetric valuation of Fuels. SCHWACKHÖFER, 1886.
Chemistry of Combustion. DIMOND, 1867.
Combustion and Economy. CLARK (D. K.), 1879.
—— Consumption of Fuel, and the prevention of smoke. FAIRBAIRN (Sir W.), 1845, 1851, p. 403.
—— High pressure combustion for mechanical power purposes. LEFROY, 1864.
Economy of. BUCHANAN (R.), 1815; PRIDEAUX, 1853; RANKINE (W. J. M.), 1867; RYDER (Capt. A. P.), 1852.
—— In Steam Vessels. ANONYMOUS, 1840, p. 57; RENTON (A. H.), 1846.
Fossil. Great Britain. ANONYMOUS, 1841, p. 46.
Fuel and its Applications. GROVES and Thorpe, 1898.
Fuel and Rational Ventilation. DENY, 1883.
Fuel and Water. SCHWACKHÖFER (F.), 1884.
Gas (Coal) as Fuel. LENCAUCHEZ, 1878; SIEMENS (Sir W.), 1881, p. 198.
—— Economy of Gas as a Fuel for Cooking Purposes. GOODWIN (W. W.), 1879.
—— Efficiency of Gaseous Fuel. DOWSON, 1888; MATTHEWMAN, 1894.
—— Fuel and Power Gas distribution in Birmingham. THWAITE (B. H.), 1892, p. 312.
—— Gaseous Fuel: SCHILLING, 1883; including Water Gas, its Production and Application. THWAITE (B. H.), 1889, p. 312.
Heating Power of Combustibles. MAHLER, 1893. Prussia. BRIX, 1853.
Liquid Fuel. HODGETTS (E. A. B.), 1889, 1890; PAUL (B. H.), 1868; SELWYN (Capt. J. H.), 1869.
—— Dorsett's Patent Apparatus for applying it to Steam Boilers and Furnaces generally. DORSETT, 1868.
—— Advantages for Firing Steam Generators. THWAITE (B. H.), 1887, p. 312.
—— In Ocean Steamers. CARMICHAEL (W. V.), 1891.
Metallurgy, Fuels used in. PERCY (J.), 1861.
Mineral Fuel. France. CAILLAUX, 1875.
Patent Fuel. Utilisation of small Coal. BASSETT (A.), 1867.
Petroleum Refuse as Fuel on Locomotive Engines. URQUHART (T.), 1884, '86, '89.

FUEL—*continued.*

Petroleum Refuse. Russia. On the Compounding of Locomotives burning Petroleum Refuse. URQUHART (T.), 1890.

Power without Fuel. BALDWIN (J. S.), 1869.

Purification. BATESON, 1892.

Solid and liquid Fuel, their calorific value estimated. ROWAN (F. J.), 1888.

Use of Fuel at a high temperature. LENCAUCHEZ, 1882.

Wet Fuel, Efficiency of Furnaces burning. THURSTON (R. H.), 1874, p. 309.

See also PEAT.

FURNACES.

Argand Furnace of C. W. Williams and its imitation by T. S. Prideaux. DIRCKS, 1854.

Assay Furnaces. Reports by Abel and Taylor relating to their Flues. SOUTH Kensington Museum, 1880.

Draught in the several parts of Retort Furnaces. COLDING, 1874.

Ferris's covered Self-cooking Furnace. BELL (Sir I. L.), 1867, p. 119.

Furnaces and Boilers. Specifications. BODMER (J. G.), 1843.

Furnaces, Forges and Steel manufactories for the Navy and Railways (Saint Chamond). COMPORTEY, 1889.

Glass and Steel on the open hearth, manufacture of. HEAD (J.), 1886.

Hot air furnace. BOYER and Consorter, 1861.

Industrial Furnaces, rational construction. FICHET, 1874.

Iron Furnaces, Askham Explosion. ASKHAM (1882).

Mechanical Puddling: its successful working in the U. S. A. RYLAND (G.), 1871.

Munich generator furnaces. SCHILLING (N. H.), [1882].

Newport Puddling Furnace. HEAD (J.), 1872.

Open-hearth Furnace. Rationale of an improved design. THWAITE (B. H.), 1891, p. 312.

Price's Patent Retort Furnace. BELL (Sir I. L.), 1875, 1876, pp. 119, 120.

Regenerator Furnaces, Construction and Working of. GRAHAM (M.), 1894. Add. 503.

Reverberatory Furnaces, for the manufacture of iron, economy of fuel. PRIDEAUX, 1853.

Schauffelen's hot-air Furnace feeder. SCHAUFFELEN, 1835.

Steam Boiler Furnaces, Improvements in. BAKER (H. F.), 1848.

Stedefeldt Furnace. EGLESTON, 1885.

Townsend Furnace, Albany, Description of. TOWNSEND (F.), 1870.

FURNACES—*continued.*

Water. Certain new methods of constructing Furnaces for heating, boiling, or evaporating of Water. WATT (James), 1855.

Wet Fuel, Efficiency of Furnaces burning. THURSTON (R. H.), 1874, p. 309.

See also BLAST FURNACES.

FURNACES (GAS FURNACES).

Construction and Working. LIEGEL, 1886.

Furnace for the manufacture of illuminating gas. BERARD (E. P.), 1889.

Gas generating Furnaces. LÜRMANN, 1880–85.

Generative or recuperative. CROCKETT, 1885.

Mendheim Continuous Gas Furnace for burning Firebrick and Porcelain. EGLESTON, 1886.

Ponsard Gas Furnace. PÉRISSÉ (S.), 1875.

Siemens' regenerative furnace. KRANS, 1869.

Siemens' Regenerative Gas Furnaces. Description. SIEMENS (Sir W. and F.), 1861.

—— Siemens' furnace arranged to recover waste Gases as well as waste Heat. HEAD (J.) and Pouff, 1890. Siemens' new furnace. DAMOUR, 1893.

Utilisation of heat in regenerative furnaces. DAMOUR, 1893.

FURNITURE (HOUSEHOLD). POLLEN, 1885.

Forty-four engravings in colours of fashionable furniture. ANONYMOUS, 1823, p. 46.

Furniture and Woodwork. BEVAN (G. P.), Industries, Vol. 7.

Tudor period. HUNT (T. F.), 1841.

FUSEES. Going Fusee. New Construction. AIRY (Sir G. B.), 1841, p. 18.

G

GALVANISM. BIRD (G.), 1849; CUTHBERTSON, 1821. WEBER (Wilhelm), 1892–94. History. BOSTOCK, 1818. Theory and practice, &c. WILKINSON (C. H.), 1804. Galvanic chain. OHM (G. S.), 1827.

See also ELECTRICITY.

GAME LAWS. Reflections and Appeals. DE BERENGER (A.), 1828.

GARDENING. My Garden, its plan and culture. SMEE (A.), 1872.

GAS, COAL (GENERAL REFERENCES).

Analysis. BOWDITCH, 1867; BROWN (J. T.), 1883. Apparatus of M. Orsat. FICHET, 1873. Methods. HEMPEL, 1892. Gas Analysts' Manual. HARTLEY (F. W.), 1879.

Applications of Gas in 1889. DELAHAYE, 1890.

Co-efficient of the dilatation of. ANTOINE (C.), 1885.

Compressibility of Gas. ANTOINE (C.), 1886.

—— Illumination by means of Compressed Gas. NURSEY, 1881.

Cooking and Heating, advantages of Gas for. OHREN, 1874.

Economic production. SPICE (R. P.), 1886.

Flow of Gases, and proportioning Gas Mains. CRIPPS, 1892.

Gas Engineers' Chemical Manual. WANKLYN (J. A.), 1886.

—— Pocket Almanack and Lighting Table for 1887, etc. SUGG (W.) & Co., 1887, etc.

Gas Examiners, Instructions for. GAS REFEREES, 1873; PARLIAMENTARY..Papers, p. 476, 1872–73.

Gas in the house. FARADAY (H.), 1843. Domestic uses. SUGG (W. T.), 1884.

Gas Interest in England. Report of a Speech. SPICE (R. P.), 1888.

Gas Managers' Handbook, 1870, '74, '83, '89. NEWBIGGING.

Gas Users, Common sense for. WILSON (Robert), 1877.

Gas and Water Engineer's book of reference. BOWER (G.), 1880.

—— Gas and Water Orders Confirmation Bill. Memorandum on provisional orders, 1888. PARLIAMENTARY..Papers, p. 480.

—— Gas and water review. PERIODICAL PUBLICATIONS, p. 15.

Heating by Gas. *See* WARMING and Ventilation.

GAS, COAL (GENERAL REFERENCES)—*continued.*

Hygienic Comparison between the Light of Coal Gas and that of Electricity. THWAITE (B. H.), 1883, p. 312.
See ELECTRICITY.

How to manage Gas. WILKINS (F.), 1868.

Law. MICHAEL and Will, 1884; STEWART (C. E.), 1889.

List of periodicals connected with the Gas Industry. PEASE (E. L.) and CRIPPS (F. S.), 1893.

Manipulation. BANISTER (H.), 1867.

Nature and Chemical properties. THOMPSON (L.), 1855.

Power (Gas). DOWSON, 1892.

Price and quality. CLEMINSHAW, 1865.

Rating Gas Undertakings. GRIFFITH (W.), 1887.

Recovery of hydrocarbons. DAVIS (G. E.), 1884.

Referees (Gas). Reports on Ammonia Impurity, 1871; Gas Burners, 1871; Sulphur Question, 1870. PARLIAMENTARY.. Papers, p. 479. Correspondence relative to appointment, 1872. PARLIAMENTARY..Papers, p. 479. Notification of the Gas Referees, 1872–77. GAS REFEREES.

Report. JERSEY (H. de), etc., 1865.

Residual Sulphur in Coal Gas. WILLS (T.), 1876.

Retort System. AUTOMATIC Coal-gas Retort Co., 1894.

Salubrity of the use of Coal gas. LEESON and Warington, 1865.

Technical Calendar. SCHAAR, 1885.

Technical Gas Analysis, Handbook of. WINKLER (C.), 1885.

Temperature of gas. ANTOINE, 1888.

Treatise on Gas. PERKINS (E. E.), 1856, 1862.

Use of Coal Gas. Cantor Lectures. DIXON (H.), 1855.

Waste products, application to agricultural and other purposes. CROLL, 1844.

GAS, COAL (MANUFACTURE OF). ACCUM, 1819, 1820; BORIAS, 1890; DARLINGTON (F. A.), 1887.

Apparatus employed. ANDERSON (G.), 1880.

Catalogue of Products obtained from the residual substances. BURT, Boulton, and Haywood, 1883.

Chemistry of Gas Manufacture. HARCOURT (A. G. V.), 1877.

Gas making and purification. BRIGGS, 1876.

Management of Clay Retorts. KITT, 1872.

Manufacture and distribution of Coal Gas. CLEGG (S.), jun., 1841, 1853, 1859; KING (W. B.), 1878.

Manufacture, use, and testing. POLE, 1873.

Modern Improvements in Manufacture. SPICE (R. P.), 1886.

Naphthalin and Benzol in Illuminating Gas. BUNTE, 1892.

Retort-house extension, cannel store, etc., Belfast Specification, etc. BELFAST, 1890, p. 116.

GAS, COAL (MANUFACTURE OF)—*continued.*

Seven Experiments on Gas making.
WILLIAMS (G.) and Martin, 1883.

Société Technique de l'Industrie du Gaz en France.
SOCIÉTÉ TECHNIQUE de l'Industrie, etc, 1874.

Treatise on its manufacture and distribution.
RICHARDS (William), 1877.

GAS, COAL (PURIFICATION). ANDERSON (G.), 1889; CROLL, 1844.

by Liquid Ammonia. HAMMOND (JOHN), 1887.

Analysis, technical valuation, purification and use. BOWDITCH, 1867.

Coal-Liming process Patent. SPICE (R. P.), 1888.

Coal Gas Purification and the advantages of Cooper's coal-liming process. SPICE (R. P.), 1884.

Manchester and Coal Liming. SPICE (R. P.), 1888.

Oxide of Iron, Action of, in Gas purifiers. SOMERVILLE (J.), 1884.

Oxygen, Use of. VALON (W. A. M.), 1888.

—— In the revivification of Oxide of Iron in purification.
VALON (W. A. M.), 1888.

Patterson's Patent. Copy of Correspondence, 1876.
PATTERSON (R. H.).

—— Infringement of Patterson's patents for Improvements in. (Appeal of R. H. Patterson against Gas Light and Coke Co.). PATTERSON (R. H.), 1877. Add. 527.

GAS (GAS PRODUCERS). Improvements in and applicable to Gas producers. SUTHERLAND (W. S.), 1885.

GAS (NATURAL). BANNISTER (L.), 1886; METCALF, 1884.

Fiery fountain of St. Barthélemy. PIRET, 1881.

In Pennsylvania and New York. CREW, 1887.

Transportation of natural Gas. ROBERTS (T. P.), 1886.

GAS (PETROLEUM, ETC.).

Gas manufactured by the decomposition of water and Petroleum.
SPICE (R. P.), 1875.

Lighting by gas of mineral oils. KÜCHLER, 1879.

London and Westminster Oil Gas Bill. Evidence before Committee, 1824. PARLIAMENTARY. .Papers, p. 479.

Tar oil and other liquid hydrocarbons, Manufacture of Gas from.
BURNS (W.), 1887.

GAS (WATER GAS). BELL (J. F.), 1889; BLASS, 1886.

Fuel of the future. Strong's Patent. QUAGLIO, 1880.

Gas manufactured by the decomposition of water and Petroleum.
SPICE (R. P.), 1875.

Heating question in connection with Water Gas production and heating. NAUMANN, 1881.

Invention and Manufacture. JOBARD, 1846.

GAS (WATER GAS)—*continued.*
Production and application. THWAITE (B. H.), 1889, p. 312.
Uses. LAFFONT, 1889.
Van Steenbergh Water Gas. VAN STEENBERGH, 1890.
Water Gaslight, Gaslight Le Prince, and Ordinary Oil Gaslight compared. VERVER (B.), 1859.

GAS BURNERS.
Rationale of the principle of Recuperation in its application to. THWAITE (B. H.), 1886, p. 312.
Siemens' (F.) Regenerative Gas Burner. GUEST and Chrimes, 1884; SIEMENS (Sir W.), 1882.

GAS ENGINES. BOURNE (J.), 1878; CLERK (D.), 1886; MACGREGOR, 1885; SCHÖTTLER, 1886; SLABY, 1886.
Bénier's gas-engine. SLABY, [1889].
Bull's gas Engine, patented by Thwaite. THWAITE (B. H.), 1885, p. 312.
Chatterton engine. CHATTERTON (B.), 1892.
Combustible Gas Engines, Invention and future of. TRESCA (H.), 1865.
Curves. SMITH (R. H.), 1888.
Determination of gas consumption. PROELL, [1891].
Dowson's 100 indicated horse-power gas motor, Experiments with WITZ (A.), 1890.
Efficiency. MILLER (T. L.), 1890.
Electric Lighting. DELAHAYE, 1890.
Elementary principles. LANE (D.), 1885.
Gas-engine Indicator-Diagram. AYRTON and PERRY, 1884.
Gas Exhauster. SAVILE (G. E.), 1878.
"Griffin" Patent, Double-Acting, Horizontal Gas Engine, Report on tests of. JAMIESON (Andrew), 1888.
Influence of cylinder walls. WITZ and Slaby, 1886.
Lenoir's Gas Engine. Experiments. TRESCA (H.), 1865.
Motors (Gas). LIECKFELD, 1891; RICHARD (G.), 1885.
—— Recent examples. LE VAN, 1890.
—— Study of Gas motors. SAUVAGE (E.), 1894.
—— Theoretical and practical treatise on gas motors. CHAUVEAU, 1891.
—— Theory of gas motors. KÖHLER (O.), 1887.
"Otto" gas engine. BROOKS and Steward, 1883.
Petroleum. Gas and Petroleum Motors. RICHARD (G.) 1892.
Petroleum in Prime Movers. ROBINSON (W.), 1892, 1891.
—— Petroleum Oil Engines. ROBINSON (W.), 1891.
—— Gas and Petroleum Engines: a treatise on the Internal Combustion Engine. ROBINSON (W.), 1890

GAS ENGINES—*continued.*

Practice. GRIFFIN (S.), 1889.
Ravel's Gas Engine. RAVEL, 1881.
Studies on Gas Engines. WITZ (A.), 1884, '89.
Text book. DONKIN (B.), jun., 1894.
Theoretical and Practical treatise. WITZ (A.), 1892–5. Add. 539.

GAS LIGHT. ROBERT D'HURCOURT (E.), 1863; RUTTER (J. O. N.), 1849; SCHILLING (N. H.), 1860, '68. Lighting by electric-gas. A light without electricity. DELAPORTE, 1886. Gas and lighting. BEVAN (G. P.), Industries, vol. 4.
Chemistry of Illuminating Gas. HUMPHREYS (N. H.), 1891.
Devices for Gas Illuminations. NEWBIGGING, 1886.
Electric lighting *v.* Gas lighting. SCHILLING (N. H.), 1883.
—— Comparative cost and value. KIRKHAM and Hersey, 1878.
—— Hygienic Comparison. THWAITE (B. H.), 1883, p. 312.
Guide to Gas lighting. WOOD (A. H.), 1872.
Heroic epistle to Mr. Winsor, patentee of Hydro-carbonic gas lights, and founder of National light and heat Co. WINSOR (F. A.), 1808.
Illuminating power. KIRKHAM, 1868.
Journal de l'Éclairage au Gaz. PERIODICAL PUBLICATIONS, p. 17.
Journal of Gas-lighting. PERIODICAL PUBLICATIONS, p. 18.
Origin, progress, and present state. MATTHEWS (W.), 1827.
Projects. MATTHEWS (W.), 1835.
Select Committee on Gas Light Establishments. Report, 1823. PARLIAMENTARY..Papers, p. 479.
Theory and practice. PECKSTON (T. S.), 1819, '23, '41.
Treatise on Gaslight. ACCUM, 1815.
Treatise on the light of gas made from coal, bitumen, lignite, and peat. PELOUZE (J.), 1839.
Wood-gas and peat-gas for illumination. REISSIG (W.), 1863.

American Gaslight Association. AMERICAN GASLIGHT ASSOC.
American Gas light Journal, etc., 1877. PERIODICAL PUBLICATIONS, p. 9.
Brazil. Gas manager abroad. NEWBIGGING, 1886.
Dublin Gas. SPICE (R. P.), 1876.
London. Reports. HAYWOOD (W.), 1853, '62, p. 31.
—— Carburation of Gas. HAYWOOD (W.), 1861, p. 31.
—— Gas Light and Coke Company. HAYWOOD (W.), 1889, p. 31.
—— Siemens' Gas lighting in Holborn. HAYWOOD (W.), 1883, p. 31.
—— Sugg's Gas lighting in Fleet Street. HAYWOOD (W.), 1883, p. 31.
—— Queen Victoria Street. New gas lamps. HAYWOOD (W.), 1879, p. 31.

GAS LIGHT—*continued.*

Madras. MAYER, 1857.

Paris. PARIS, p. 460. Lighting by hydrogen gas. MANBY (A.), etc., 1822.

Rochester, Lighting with gas. A Bill to incorporate a company for that purpose. ROCHESTER, 1825.

Sheffield. Progress. KEY (J. T.), 1883.

GAS-METERS.

Board of Trade Memorandum on the re-verification of Gas Measuring Standards. PARLIAMENTARY..Papers, p. 480.

Clegg's dry gas-meter. CLEGG, 1838.

Construction and use of Gas Meters. CROLL, 1845.

Fallacies and frauds. JONES (W.), 1843.

Manchester. Report on Gas Meters. MANCHESTER, 1858.

Measurement, Correct Gas. GLOVER (G.), 1879.

—— Gas Measurement and Gas Meter Testing. HARTLEY (F. W.), 1882.

Standard Gauges for the connecting pipes used with gas meters, 1887. PARLIAMENTARY..Papers, p. 480.

GAS SUPPLY.

Automatic Gas Machine Company. Prospectus, 1887. AUTOMATIC Gas Machine Co.

Birmingham. Fuel and Power Gas distribution in. THWAITE (B. H.), 1892, p. 312.

Brighton and Hove Gas Act, 1879. BRIGHTON.

Commercial Gas Company Bill, 1875. Minutes of Evidence, etc., 1875. COMMERCIAL Gas Co. Add. 493.

Consolidation Acts (Gas Supply), 1847. PARLIAMENTARY..Papers, p. 479.

Conveyance of Gas. STEWART (G. R.), 1884.

Correspondence relative to the supply of Gas by the Great Central Gas Consumers' Company. DAKIN, 1853.

Crystal Palace District Gas and the Gas Light and Coke Co.'s Bills, 1877. Report on. CRYSTAL Palace Gas Co. Add. 494.

Darlington Act, 1849. DARLINGTON.

Gas Light and Coke Company. Acts, Charter, and Returns. GAS Light and Coke Co., 1823, '74. Add. 502.

—— Injurious effects of pending Bill upon the inhabitants of Fulham and Chelsea. REE, 1865.

Gas undertakings. LASS, 1888. Precedents in Private Bill legislation affecting, 1879–90. STEVENSON (E. H.), and Burstall, 1890; STEVENSON (G. W.), 1879.

General Acts. REESON, 1874.

Great Central Gas Company. CROLL, 1875.

GAS SUPPLY—*continued.*

Great Central Gas Consumers' Company. Reports, 1850, '57. GREAT CENTRAL.

Hartlepool Gas and Water Act, 1890. HARTLEPOOL.

Henley-on-Thames Gas Act, 1888. HENLEY-ON-THAMES.

Hills *v.* London Gaslight Company. Report of Trial. HILLS (F. C.), 1852.

Houghton-le-Spring Gas Company Act, 1879. HOUGHTON.

Inverness Gas and Water Bill. Report, 1847. INVERNESS.

Kendal Gas and Water Supply Act. KENDAL, 1846.

London. Existing conditions and circumstances affecting. HAYWOOD (W.) and Letheby, 1865.

—— Consumption of Gas at the Public Lamps. HAYWOOD and Letheby, 1862.

—— City of London Gas Act, 1868. LONDON, p. 260.

—— Metropolitan Gas Companies' Accounts, 1856, etc. LONDON, p. 261.

—— Analysis of the Gas Companies' Bills, 1869. LONDON, p. 261.

—— Imperial and South Metropolitan Gas Companies' Bills. Report of Parliamentary Committee. LONDON, p. 261.

—— Gas Works and Gas Lighting in London. LONDON, p. 261.

—— Correspondence, 1868, '69. LONDON, p. 261.

—— Cost and Supply of Gas, 1849. LONDON, p. 261.

—— Special Committee. Report, 1867. LONDON, p. 261.

—— Metropolitan Gas Inquiry, 1860. Report of Committee of the House of Commons. LONDON, p. 261.

—— Gas Referees, 1873–74, etc. LONDON, p. 261.

—— Report on increase of price of gas, 1874. LONDON, p. 261.

—— City of London Gas Company. Analysis of Accounts, 1868. LONDON, p. 261.

—— Metropolitan Gas Companies' Bill. Report from Select Committee, 1875. LONDON, p. 261.

—— Metropolitan Gas Bill. Report from Select Committee, 1867. LONDON, p. 261.

—— Imperial Gas Company's Bill. Course taken by the Board, 1869. LONDON, p. 261.

—— Gas Examiner's Reports, 1868–78. LONDON, p. 262.

—— London and its Gas Companies. HUGHES (S.), 1863.

—— London Gas Companies: their future control. Letter to Sir S. Northcote as to the proposals of the board. THWAITES (J.), 1867.

—— Metropolitan Gas Companies' Accounts Analysis, 1867, etc. FIELD (J).

Malmö. Lease of the gaswork of the town. MALMÖ, 1883.

Marple Local Board Gas Act, 1886. MARPLE, 1886.

GAS SUPPLY—*continued.*

Midland Association of Gas Managers. Reports, 1878–84. MIDLAND Association.

North British Association of Gas Managers. Reports, 1867–91. NORTH British Assoc. Statistical report, July 1890 to Aug. 1891. NORTH British Assoc. Add. 524.

Paris Gas Company. Flow of gas in long pipes. ARSON 1868.

Pontypool. Evidence. PONTYPOOL, 1873.

Ramsgate, 1877–90. RAMSGATE, p. 80.

Relation of the Modern Municipality to Gas Supply. JAMES (E. J.), 1886.

Returns of gas undertakings in the United Kingdom, 1882, etc., 1885, etc. PARLIAMENTARY. Papers, p. 479.

Ryde Gas Arbitration. Story of. SPICE (R. P.), 1872.

Scotland. Report, 1891. NORTH British Assoc.

Scotland, West of, Association of Gas Managers. Reports of Proceedings. WEST of Scotland, etc., 1875–79.

Supply and distribution. CLAYTON (A. G.), 1883.

Thirsk Gas and Water Provisional Order Confirmation Bill, 1879. THIRSK.

Woking Gas Act, 1885. WOKING.

GAS SUPPLY (GASWORKS).

Arrangement, construction, etc. COLYER, 1884.

Construction. HERRING (W. R.), 1892, '93.

Gasholders. PEASE (E. L.) and Cripps, 1893.

—— Guide framing of Gasholders. CRIPPS, 1889.

Gas Works and the Introduction of Cannel Coal Gas into the Metropolis. TAYLOR (G. L.), 1848.

Management. HOLMES (W. C.), 1874.

Purchase of gasworks with the latest statistics of gas supply. SILVERTHORNE (A.), 1881.

Rating of. QUICK, 1880.

Statistics, 1879–86. HASTINGS (C. W.).

Transfer of gasworks to the Local Authorities. SILVERTHORNE (A.), 1871, 1873.

Treatise on Gas Works. HUGHES (S.), 1875, '85.

Valuation of Gasworks for Assessment. NEWBIGGING, 1891.

Amsterdam. New Gasworks (Imperial Continental Gas Association). PAZZANI, 1886.

Beckton and Bow Gasworks, Sulphur purification at. BECKTON, 1872.

Birmingham. Windsor Street Gas-Works. HUNT (C.), 1886.

Cologne. COLOGNE, 1875–77.

GAS SUPPLY (GASWORKS)—*continued.*

Exeter. Report on their state and observations thereon by Spice. STEVENSON (G. W.), 1877.

Germany, Switzerland, etc. SCHILLING (N. H.), 1868, '77.

Le Mans, Gas works at. SEGUIN (L.), 1892.

London. COLBURN, 1865.

—— Necessity for removing gasworks from London, as has been done in Paris. SIMPSON (T. B.), 1866.

Philadelphia. Reports. CRESSON, 1841; PHILADELPHIA, 1836–45, p. 34.

Sydney Gas-Works. Description of a three lift gas holder. SYDNEY, 1889, p. 272.

Victoria Gas Co. Act for incorporation and for authorising the acquisition and enlargement of the North Woolwich Gas works. VICTORIA Gas Co., 1857.

GASES.

Apparatus for purifying, burning, and generating gases. SUTHERLAND (W. S.), 1879.

Combustible gases, Production of. GRUNINGER, 1890.

—— Production and application and Purification, etc. SUTHERLAND (W. S.), 1883, 1884.

Combustion of explosive gases. MALLARD (E.) and Le Chatelier, 1883.

Dynamical Theory of gases. MAXWELL, 1860, '67.

Experiments on Powder gases. KALAKOUTZKY, 1879.

Gases and Mining. BAKER (J. P.), 1870.

Kinetic Theory of Gases. WATSON (H. W.), 1876, 1893.

Method of Collecting the gases given off from Furnaces. LANGEN, 1862.

Properties of gases. BUNSEN, 1857

—— Physical Properties of gases. KIMBALL, 1890.

Proposal for heating large towns with Pyrogen gas. KNOWLES (Sir F. C.), 1874.

Tables for Gasometry. BAUMANN, 1885.

Treatise on the Gases met with in Coal Mines. ATKINSON (J. J.), 1879.

Waste Gases, Disposal of. GOODACRE, 1891.

GASES (EXPLOSIONS). *See* EXPLOSIONS.

GAUGES. Improved Gauge for ascertaining the pressure of highly compressed steam, gases, and fluid bodies. SEAWARD (S.), 1824.

Apparatus invented and constructed by E. Bourdon. BOURDON, 1862.

GAZETTEERS. *See* GEOGRAPHY (Gazetteers).

GEMS. Poniatowski Collection, Remarks on fallacious opinions respecting. PONIATOWSKI, 1842.

GEOGRAPHY. GROVE (Sir G.), 1877.
Ancient Geography, disputed questions. LEAKE, 1857.
Cities of the World. HODDER, 1880.
Definition of terms used in. HODGKIN, 1804.
Direct Highway to the East. JONES (Capt. F.), 1872, p. 165.
English and Continental Inter-Communication. NURSEY, 1869.
Exhibition of 1878. BRUSSELS.
Hints to travellers, scientific and general.
ROYAL Geographical Soc., 1889, p. 139.
Lectures on Geography. STRACHEY (Lt.-Gen. R.), 1888.
New routes of the globe. HÉLÈNE, 1883.
New Survey of the Globe. TEMPLEMAN (T.), 1730.
Overland route to India, China, &c. GALLOWAY (J. A.), 1844; SIMMS (F. W.), 1878. World's Highway. ANONYMOUS, 1856, p. 58.
Relative quantities of Land and Water on the Surface of the Earth. RIGAUD (S. P.), 1837. App. 573.
Sea Routes. BAUDRAND, 1870.
Stanford's Compendium of Geography and Travel, Europe, Asia, Africa, America, Australasia. STANFORD (E.), 1883–94.
Universal Geography, the earth and man. RECLUS, 1876–82.
Universal route book by sea, by land, and by rail. DEMPSEY, 1870.
Voyage round the world in 1766, '7, '8, and '9.
BOUGAINVILLE (Comte L. A. de). App. 549.

Aden. Descriptive account of the Settlement. ADEN, 1891.
Afghanistan (Southern) and the North Western Frontier of India. VYSE (G. W.), 1881.
Africa. JOHNSTON (A. K.), 1884.
—— Plan of territories formerly known as Kaffraria Proper. KAFFRARIA, 1884.
—— Circular by the Committee of the Royal Geographical Society to administer the African Exploration Fund.
ROYAL Geographical Society, 1877.
Aiguesmortes. PIETRO, 1821.
Alabama, U.S.A., Hill Country of. ALABAMA, 1878.
Albany, N.Y., New Capitol Commissioners' Annual Reports. ALBANY, 1870–71.
Alps, Passes of the, by which Italy communicates with France, Switzerland, and Germany. BROCKEDON, 1828.
—— Route du Simplon. CÉARD, 1820.
—— Mont Blanc and the Simplon considered as international ways. BÉRARD (E.), 1880.
American Notes, 1881. SUTTER (A.), 1882.
—— Resources, etc., of America. PETO (Sir S. M.), 1866.
—— Trip to America. HOWARD (J.), 1867.

GEOGRAPHY—*continued.*

America. Wanderer in. WILSON (C. H.), 1822.
America (Central). Advantages of a road across Central America from Admiral's Bay, on the Atlantic, to Chiriqui Bay, on the Pacific. AMERICA, 1852.
—— Free Indian Tribes of Central America. BOYLE (F.), 1867.
—— Transit Route through Central America. PIM (B.), 1862.
—— (Central and South) and West Indies. BATES (H. W.), 1885. Add. 484.
—— (North). HAYDEN (F. V.) and Selwyn, 1883. Add. 506.
—— North American Boundaries. Correspondence. AMERICA, 1838–43.
—— North America in 1853 and 1854. LAMBERT, 1855.
—— Northern Traveller, or routes to Niagara, Quebec, and the Springs. GOODRICH, 1826.
—— (North). Travels through the interior parts of, in 1766, 1767, and 1768. CARVER.
—— (South). Visit to. CLARK (E.), 1878.
—— Western republics of America. BYAM, 1850.
Arabia Petræa, and Palestine. Geography of. HULL (E.), 1886. Add. 509.
Arctic and Antarctic Explorations. WHITE (W.), 1850–1.
—— Baffin Bay. Remarks on. ALLEN (R. C.); Snow and Inglefield, 1853.
—— Map of the Polar Regions, Baffin Bay to Lincoln Sea. AMERICA, 1885.
—— Baffin's Bay. Remarks on Captain Ross' Account of the late voyage of discovery. SABINE (Sir E.), 1819.
—— Sir John Franklin's Expeditions, 1850. PARLIAMENTARY. . Papers, p. 465.
—— Greely Relief Expedition. Report of W. S. Schley. SCHLEY (W. S.), 1887.
—— Hall's Second Arctic Expedition. YARNALL (E. H.), 1880.
—— International Polar Expeditions, 1882–83. INTERNATIONAL P. E.
—— Last of the Arctic Voyages. BELCHER, 1855.
—— Sir G. S. Nares's, 1875–76, "Journal" and "Proceedings"; equipment and fitting out; Results: Physical Observations, Eskimo Dog Disease; Outbreak of Scurvy. PARLIAMENTARY. . Papers, p. 465.
—— Voyage to North Pole, 1773. PHIPPS (C. J.). App. 571.
—— Travels in the English yacht "Pandora." BECKER (A. R. von), 1878.
—— North Polar Expedition, U.S. ship "Polaris." DAVIS (C. H.), 1876.
—— United States ship "Polaris." HALL (C. F.), 1876.

GEOGRAPHY—*continued.*

Arctic. Second Arctic Expedition, made by C. F. Hall.
HALL (C. F.), 1879.

Argentine Republic. NAPP, 1876.

—— Country of. ARGENTINE, 1869.

—— Engineering, Finance, Mines, Public Works, Railways, Weights and Measures. ARGENTINE.

Arizona and Sonora. Geography and resources. MOWRY, 1863.

Arkansas Valley. PANGBORN, 1878.

Asia. KEANE, 1886.

Auckland Islands. ENDERBY, 1849.

Austria. BAEDEKER.

—— Position and prospects. LEVER, 1861.

Austrian Tyrol, Bavaria, etc. Tour through them.
SPICE (R. P.), 1879.

Azores, St. Michael's Island. A summer trip.
SWINDELLS (R.), 1878.

Baghdad. JONES (J. F.), 1857.

Barcelona, improvement of. CERDA, 1867.

Belgium and Holland. BAEDEKER.

Bombay Presidency, 1884. INDIA, p. 111.

Borneo. Districts lying between Gaya Bay and the Tampasuk River. BORNEO, 1859.

Brazil, Chorography of. MACEDO, 1873.

—— Exploring and travelling 3000 miles through.
WELLS (J. W.), 1886.

—— Pioneering in South Brazil. BIGG-WITHER, 1878.

—— Southern Provinces. CARVALHO, 1884.

—— Year in Brazil. DENT, 1886.

Brazils and La Plata. STURZ, 1865.

Buffalo, Some things in and about. BUFFALO, 1884.

Burma. People and productions. MASON (F.), 1882–83.

Bustar. Papers relating to the Dependency of Bustar, 1863.
INDIA, p. 114.

Canada, Western U.S., and Mexico, Five Months fine weather in.
CARBUTT (M.), 1889.

—— Sandford Fleming's expedition. GRANT (G. M.), 1873.

—— Picturesque Canada. GRANT (G. M.), 1885.

Carolina (South). HAMMOND (H.). 1883.

Charleston, South Carolina, centennial celebration of the Incorporation of, 1883. CHARLESTON, S.C.

Celebes, Island of. Narrative of Captain David Woodard, who lost his ship, and was captured by the Malays.
WOODARD (Capt. David), 1805.

GEOGRAPHY—*continued.*

Ceylon. DEANE (A.), 1875.
—— Adam's Peak, Ceylon. DAVEY, 1818.
Château Caradoc. BESANÇON, 1866.
China. Journey of exploration through the South China border lands, from Canton to Mandelay. COLQUHOUN, 1883.
—— Chinese Empire. CHINA, 1798.
—— Rival Routes to China. HALLETT (H. S.), 1888.
Connecticut, Massachusetts, and Rhode Island. Geographic Dictionaries of. GANNETT (H.), 1894. Add. 502.
Constantinople and the Bosphorus. ANDREOSSY, 1828.
Cuba and Nassau, the Winter Sanatoriums. CUBA, 1886.
Cutch, Gulf of. BAIRD (A. W.), 1880.
Cyprus, Three Months in. BROWN (S.), 1879.
Dakota, Black Hills of. Reconnaissance in 1874. DAKOTA, 1875.
Delhi, Jama Masjid. Description. BALMOKAND, 1881.
Duluth, The "New York" of the great Inland Lakes. MERCHANT, 1887.
East Indies (Dutch). DUTCH, 1872.
Egypt (Lower). BAEDEKER.
Egypt (Ancient). GLIDDON, 1848.
—— Arts, Antiquities, and Chronology of. WATHEN (G. H.), 1843.
Egypt, Aden, and Australia. Sherriff's Charts and Handbook to them. SHERRIFF (—), 1893.
—— and the Holy Land. CONRAD (F. W.), 1859.
—— Letters. BARTHÉLEMY SAINT HILAIRE, 1857.
—— Proposals for Scientific Exploration of Egypt and Ethiopia. WILD (J. J.), 1850.
—— Notes on a visit to Egypt, *viâ* Paris, Lyons, Nismes, Marseilles and Toulon. SOPWITH (T.), 1857, p. 225.
—— Political, financial and strategical. VYSE (G. W.), 1882.
Europe. Edited by Ramsay. (Stanford's Compendium.) RUDLER (F. W.) and Chisholm, 1885.
—— Guide-book for English-speaking travellers. APPLETON (D.), 1891.
Floridas. Observations. VIGNOLES (C. B.), 1823.
France. Maritime ports. JEFFERYS, 1774.
Galilee (Sea of). OLIPHANT (L.), 1887. Add. 524.
Germany, Bohemia, Hungary, Switzerland, Italy and Lorrain. KEYSLER, 1760.
Germany (Northern and Southern). BAEDEKER.
Gesoriacum. Locality of the Roman Gesoriacum. AIRY (Sir G. B.), 1870, p. 20.
Goshen (Land of). AIRY (Sir G. B.), 1865, p. 17.

GEOGRAPHY—*continued.*

Gravelines. GRAVELINES, 1873.
Guinea (Gulf of), Exploration of. BUCHANAN (J. Y.), 1888.
Havre in 1878. FAURE, 1878.
Herculaneum. BRETON, 1855.
Himalaya Mountains and Nepal, 1857. INDIA, p. 119.
Holland and the Dutch Colonies. MACGREGOR (J.), 1848.
Hudson's Bay and Strait. BAILEY (J. C.), 1884.
Iceland: the Faroes. BRINE, 1881.
Ilios: the city and country of the Trojans. SCHLIEMANN (H.), 1880.
India. Allen's Map of India. ALLEN (W. H.) & Co., 1842.
—— Alternative Route. MATHEW (Francis).
—— Central Provinces. Topographical Report on the Political Districts of Raiguhr, Sarungurh, Sonepore, and Sumpulpore, 1855. INDIA, p. 115.
—— Communications with British India under possible contingencies. GOLDSMID, 1878.
—— British India. COTTON (J. S.) and Payne, 1883.
—— Administration of the Marquis of Dalhousie, 1848–56. DALHOUSIE, 1856.
—— Frontier Tribes on the north-east border of Assam, 1855. INDIA, p. 109.
—— Highlands of India, 1882–87. NEWALL (D. J. F.).
—— India and her neighbours. ANDREW (Sir W. P.), 1878.
—— North-West Provinces. RAIKES, 1852.
—— Northern Littoral districts of the Madras Presidency, 1856. INDIA, p. 122.
—— Overland Route, India to England. LATHAM (G.), 1870.
—— Passage to India through Egypt and across the Great Desert. CAPPER (J.), 1784.
—— —— *viâ* the Red Sea and *viâ* the Cape of Good Hope. RED SEA, 1838.
—— Productive Resources of India. ROYLE (J. F.), 1840.
—— Progress and Condition. INDIA, p. 103.
—— Public Service Commission. INDIA, p. 103.
—— Our Scientific Frontier. ANDREW (Sir W. P.), 1880.
—— Report on the Eastern Frontier. PEMBERTON (Capt. R. B.), 1835.
—— Indus and its provinces considered in connection with improved means of communication. ANDREW (Sir W. P.), 1857.
Italy. BAEDEKER.
—— Ischia. Administrative prescriptions. ISCHIA.
—— Kingdom of the Two Sicilies. CUCINIELLO and Bianchi

GEOGRAPHY—*continued.*

Japan. Mikado's Empire. GRIFFIS, 1886.
—— Eight years in Japan, 1873–81. HOLTHAM.
—— History, traditions, and religions. REED (Sir E. J.), 1880.
Jerusalem. Temple. ADLER, 1887.
Jummoo and Kashmir Territories. DREW (F.), 1875.
Kansas. Description of the States of Kansas and Missouri. FRYER, 1887.
Karachi, past, present, and future. BAILLIE (A. F.), 1890.
Kattywar, Resources of the Province, 1856. INDIA, p. 121.
Krà, Journey across the Isthmus of. LOFTUS, 1883.
La Plata, foundation of the capital of the Province of Buenos Aires. LA PLATA, 1883.
Lake Superior, Exploration of the country between, and the Red River Settlement. DAWSON (S. J.), 1859.
Languedoc State and the Department of l'Aude. TROUVÉ (Baron), 1818.
—— Communication between the two seas. FROIDOUR, 1672.
Lyons. Dead cities of the Gulf of Lyons. LENTHÉRIC, 1879.
Madeira in 1883. SPICE (R. P.), 1884.
Madeira and Mamoré. PINKAS, 1885.
Malta, Alexandria, Cairo, Thebes, Upper Egypt, and Nubia. Photographic Views. MURRAY (R.), 1859.
Malta and Valetta (newspaper cuttings, photographs, etc.). TUCKER (J. S.), 1872, '3.
Maryland, Pennsylvania, and Delaware, Intersection of the boundary lines of. Reports. MARYLAND, State of, 1850, '62. Add. 519.
Mexican Republic. Colonization, Industry and Commerce. MEXICO, 1887.
Mexico. Pastrana Mine Batopilas. RANDOLPH, 1881.
—— Valley of Mexico. GARAY, 1888.
Middlesborough, Kentucky. MIDDLESBOROUGH, 1890.
Midnapore (including Hijelee) and Cuttack, 1858, Districts of. INDIA, p. 126.
Milan and its territory. CANTU, etc., 1844.
Montana. Climate, soil, etc. MONTANA, 1883.
Mont Cenis route. DERRIEN, 1816.
Montpelier, Paris, Geneva, and Great St. Bernard. RAULIN, 1864.
Murray River district. MURRAY River, 1856.
Nebraska and Dakota, Explorations in. Report, 1855–57. NEBRASKA.
Netherlands. BEEKMAN, 1884.
Nevada and Arizona, Explorations and Surveys, principally in. NEVADA, 1872.

GEOGRAPHY—*continued.*

Nevada and Arizona. Reconnaissance through Southern and South-Eastern Nevada. NEVADA, 1875.

New Granada and Costa Rica Boundary question. NEW GRANADA, 1852.

New York and San Francisco in 1882, Wanderings between. SPICE (R. P.), 1882.

Niagara, State Reservation. Report of Commissioners, 1890. NIAGARA.

Nicaragua in 1859. FINNER, 1860.

—— Two routes through Nicaragua. OLIVER (S. P.), 1867.

Nineveh. JONES (J. F.), 1857.

Nizam's dominions, Sketch of the. BILGRAMI and Willmott, 1883–4.

Norway and Sweden. BAEDEKER.

Odessa, Contract for the execution of certain works at. BAZALGETTE (Sir J. W.), 1863.

Orissa, Present State of. HALY, (G. T.), 1866.

Oudh, Province of, 1862. INDIA, p. 128.

Pacific, North-West. Oregon and Washington Territory. OREGON, 1883.

—— Central Route to the, from the Valley of the Mississippi to California. HEAP (G. H.), 1854.

Panama, Two years at. CERMOISE, 1886.

Paraguay. MASTERMAN, 1869.

Paris. BAEDEKER.

Patagonia. MORENO, 1879; QUESADA (V. G.), 1875.

Pathân and Biloch, Across the Border, or. OLIVER (E. E.), 1890.

Paumban Channel. INDIA, 1856, p. 128.

Pegu, Province of. Reports, 1856. INDIA, p. 128.

Peru. PAZ SOLDAN (Mateo), 1862. Add. 527; RAIMONDI, 1874–76.

Pompeii. BRETON, 1855.

Portugal. FORRESTER, 1853.

Portuguese African Territories. Reply to Livingstone's Accusations. LACERDA, 1865.

Provence. LENTHÉRIC, 1878, '80.

Red River Expedition. HUYSHE, 1871.

Red Sea. Welsted's attack on Lord Valentia's work on the Red Sea refuted. ROBINSON (F.), 1842.

Rhine. BAEDEKER.

River Plate Republics. MULHALL, 1875.

—— States of the River Plate. LATHAM (W.), 1866.

"Rob Roy" on the Jordan, Nile, Red Sea, and Gennesareth: a canoe cruise in Palestine, Egypt, etc. MACGREGOR (J.), 1869.

Rocky Mountain Scenery. Sun pictures. HAYDEN, 1870.

GEOGRAPHY—*continued.*

Rocky Mountain Tourist. PANGBORN, 1878
Rome, Ancient. NARDINI, 1818.
—— Remains of Ancient Rome. BELLORIUS, 1673.
Russia, Advance of. ANDREW (Sir W. P.), 1886.
—— Its origin and development. BOULTON (S. B.), 1882.
San Francisco and back. RAE (W. F.), 1871.
São Paulo Geographical Commission. SÃO PAULO, 1889.
Satara Territory, Memoir of, 1857. INDIA, p. 130.
Scottish Geographical Magazine. PERIODICAL PUBLICATIONS, p. 24.
Shanghai Bund. Photographs and plans of American and English Settlements. SHANGHAI, 1866, 1891.
Sierra de Curá-malal (Currumalan). HOLMBERG, 1884.
Sikkim and Tibet. Convention between Great Britain and China, 1890. INDIA, p. 130.
Sinaloa. BUELNA, 1877.
Soissons-l'Abbaye de Saint Leger. LAPRAIRIE and Poquet, 1850.
Soudan, Eastern, and Central Africa, Policy. SOUDAN, 1885.
Seoul, Journey from, to the Phyŏng Kang Gold Washings. COREA, 1885.
Spain, Commercial and Industrial. HIGGIN, 1886.
Spain in 1866. HIGGIN.
Suez and its trade with the ports of the Red Sea. DASSY, 1859.
Suez, Isthmus of. BORDE, 1870.
Sumatra, West Coast. SUMATRA, 1883; VERBECK, 1883.
Sunderbund. Soonderbun Channels. INDIA, 1854, p. 132.
Sweden. DAHLBERG [circa 1700]; THOMÉE (G.), 1866.
Switzerland. BAEDEKER.
—— Swiss Baths. SWITZERLAND, 1830.
Terni. RICCARDI, 1818.
Tinnevelley District, 1878. INDIA, p. 132.
Tounghoo District, 1856. INDIA, p. 132.
Tripoli, Barbary. Trade and Commerce, 1870. HAY (D.), 1871.
Tunis, Journey to. BOTLEY, 1879.
Turkey in Asia. Undeveloped resources. AUSTIN (C. E.), 1878.
—— Some Notes on Turkey. TURKEY, 1867.
Turkey (Frontier of) and Persia. JONES (J. F.), 1857.
Turkestan. Visit to Kokan. KHOKAND, 1863.
United States. BROMLEY, 1876.
—— Western States and Cincinnati in 1826. BULLOCK, 1827
—— Cave Exploration in Eastern United States. MERCER (H. C.), 1894. Add. 520.
—— Expedition through the Big Horn Mountains, Yellowstone National Park, etc. Report. SHERIDAN (Gen. P. H.), 1882.

GEOGRAPHY—*continued.*

United States. Mason and Dixon's line. Boundary lines of the States of Maryland, Pennsylvania, and Delaware. GRAHAM (J. D.), 1862.

—— United States and Territories. Boundaries. GARNETT (H.), 1885.

—— Tourists' Guide. ALLAN Line, 1881.

—— Utah, Territory of. Report of Explorations across the Great Basin of the. UTAH, 1876.

—— Ute Country. Report of a reconnaissance in, made in 1873 by Ruffner. UTE Country, 1874.

Uruguay. Its geographical history, commerce, etc. URUGUAY, 1883.

Venezuela. HAWKSHAW, 1838.

—— Statistical Annuary of. VENEZUELA, 1884–87.

Wyoming, North Western. Yellowstone National Park, Reconnaissance of. JONES (Wm. A.), 1875.

Yellowstone Park. Annual Reports, etc. YELLOWSTONE Park, 1881, '83.

Zuiderzee. ZUIDERZEE-Vereeniging, 1892.

See also Topography.

GEOGRAPHY (GAZETTEERS).

Gazetteers and Dictionary of Geography. BROOKES, 1801; JOHNSTON (A. K.), 1877. Index Geographicus. JOHNSTON (A. K.), 1864; LIPPINCOTT (J. D.), 1893. Add. 515. WRIGHT (Rev. G. N.), 1834–35.

Geographic Dictionaries of Connecticut, Massachusetts, and Rhode Island. GANNETT (H.), 1894. Add. 502.

Geographical Dictionary of the World. LIPPINCOTT (J. D.), 1893. Add. 515.

—— Imperial Gazetteer. BLACKIE (W. G.), 1860, 1868.

—— Cyclopædia of India and of Eastern and Southern Asia. BALFOUR (E.), 1871.

India Imperial Gazetteer. HUNTER (Sir W. W.), 1881.

Indian Gazetteer. THORNTON (E.), 1893.

Library Cyclopædia of Geography. BRYCE and Johnston, 1880.

Pocket Gazetteer of the World. BARTHOLOMEW (J. G.), 1888.

Railway and Commercial Gazetteer of England, Scotland and Wales. McCORQUODALE & Co., 1882, '94.

United States. Geographical Dictionary. COLANGE, 1884.

GEOGRAPHY (PHYSICAL). ANSTED, D. T. 1850; ANSTED, D. T. 1868; COOLEY (W. D.), 1876; SOMERVILLE (Mrs. Mary), 1849.

Brazil. Physical Geography. WELLS (J. W.), 1886.

GEOGRAPHY (PHYSICAL)—*continued.*

Canada. Physical Geography. SELWYN (A. R. C.), and Dawson, 1884,
Great Britain. RAMSAY (A. C.), 1863, 1878.
New South Wales. RUSSELL (H. C.), 1892.
Sea. MAURY, 1855, '60
Typical Mountain Ranges. An application of the calculus of probabilities to physical geography. SPOTTISWOODE (W.), 1860.

GEOLOGY (GENERAL REFERENCES). ANSTED D. T. (1850); BAKEWELL (F. C.), 1854; BAKEWELL (R.), 1815; BAYLE, 1869; BEUDANT, 1874; BOWEN, 1865; BRAUDE, 1829; COLE (G. A. J.), 1891; DANA (J. D.), 1869, 1879. Text books, DANA, 1869; GEIKIE (Sir A.), 1882; JUKES, 1872; LE CONTE, 1883; PHILLIPS (J.), 1835, '85; PHILLIPS (W.), 1826; PORTLOCK, 1859; SELLE (A. de), 1878.

Advantage to the Civil Engineer of a study of Geology. READE, 1888.
Annuaire géologique universel et guide du géologie autour de la Terre. PERIODICAL PUBLICATIONS, p. 11.
Application to Acts and Agriculture. ORBIGNY and Gente, 1851.
To the Arts and manufactures. ANSTED, (D. T.), 1865.
Applications. RAMSAY (A. C.), 1852.
Archiv für practische Geologie. PERIODICAL PUBLICATIONS, p. 12.
Astronomical influence upon geological phenomena. HERSCHEL (Sir J. F. W.), 1832, p. 50.
Chemical and Physical geology. BISCHOF, 1854–59; CAVENDISH Society, 1854–59.
Chemical, physical and stratigraphical. PRESTWICH, 1886.
Consumption, Geology and. WHITAKER (W.), 1869.
Elements, 1865. LYELL.
Engineer, Applied to the art of the. BUZZI, 1878; NIVOIT, 1887–89.
Engineer's Manual. VARLEY, 1846.
Engineering Geology. PENNING (W. H.), 1880.
Field Geology and Palæontology, Text Book of. PENNING (W. H.), 1879.
Geological Glossary. OLDHAM (T.), 1879.
Geological Magazine. PERIODICAL PUBLICATIONS, p. 16.
Geological Record. An account of works on Geology, etc., published during the years 1875–89. PERIODICAL PUBLICATIONS. Add. 528.
Geologist. PERIODICAL PUBLICATIONS, p. 16.
Great Ice Age and its relation to the Antiquity of Man. GEIKIE (J.), 1874.

GEOLOGY (GENERAL REFERENCES)—*continued.*

History. RAMSAY (A. C.), 1849.
How to observe. DELABECHE, 1836.
Index Geologicus. BARTLETT.
International Geological Congress, London, 1888. INTERNATIONAL Geol. Cong.
Manual. DELABECHE, 1832, '33.
Mineralogy considered with reference to Natural Theology. BRIDGEWATER Treatises, 6.
Museum of Economic Geology and Mining Records Office, Account. SOPWITH (T.), 1843, p. 224.
Natural History, Relations of, to geology and the arts. FORBES (E.), 1851.
Neues Jahrbuch für Mineralogie, Geologie, etc. PERIODICAL PUBLICATIONS, p. 20.
New System of Geology in which Modern Science and Sacred History are reconciled. URE (A.), 1829.
Petrology. PINKERTON (J.), 1811.
Physics, Geology and General. THOMSON (Sir William), 1889–94.
Popular Geology, Sketchbook. MILLER (Hugh), 1869.
Practical Geology, Museum of. Catalogue of the Geological Mining and Metallurgical Models. BAUERMAN, 1865.
—— Government School of Mines. DELABECHE, 1851.
Practical Geology and Mineralogy. TRIMMER (J.), 1841.
Principles, 1833, '40, '53, '67. LYELL.
Progress. DICKINSON (J.), 1887.
Revue de Géologie. PERIODICAL PUBLICATIONS, p. 23.
Students' Elements, 1871. LYELL.
Theoretical. DELABECHE, 1834.
Value to the military engineer. COOKE (A.), 1864.
Wonders. MANTELL, 1839.

GEOLOGY (SPECIAL).

Age of the Earth, Calculation of, based upon the hypothesis of the permanence of oceans and continents. READE, 1883.
Antiquity of man, Geological evidence of. 1863. LYELL.
Chalk between Croydon and Ostend, Some Sections of. EVANS (E.), 1870.
Chemical denudation in relation to geological time. READE, 1879.
Compressive stress in Rocks, Cause of active. READE, 1891.
Construction of geological cuttings. CHANCE (H. M.), 1881.
Continental growth and geological periods. READE, 1894.
Contraction during the cooling of intrusive masses of granite. READE, 1889.

GEOLOGY (PLACES)—*continued.*

America (North). Record, 1887–91.
DARTON, 1891 ; DARTON. Add. 495.

America (Central). Geology of a part of Costa Rica.
ATTWOOD, 1882.

Alt River. Submarine Forest of the Alt Mouth. READE, 1878

Arabia Petræa and Palestine. Physical Geology.
HULL (E.), 1886. Add. 509.

Atlantic (North) as a geological basis. READE, 1885,

Australia. Geology of Australian Goldfields.
WATHEN (G. H.), 1855.

—— Australia physical structure. JUKES, 1850.

—— Queensland. Geological features of the south-eastern districts. QUEENSLAND, 1879, p. 71.

—— South Australia. Adelaide to Hale River. Report on a journey. SOUTH Australia, 1889, p. 227.

—— Port Augusta to Eucla. Report on the Geological Character of the country. SOUTH Australia, 1885, p. 227.

—— Barossa Hundred. Geological map of its tertiary deposits.
SOUTH Australia, 1889, p. 227.

—— Gumeracha and Mount Crawford Goldfields. Notes on Geological map. SOUTH Australia, 1887, p. 227.

—— Warrina to Musgrave Ranges. Report on a Journey.
SOUTH Australia, 1890, p. 227.

—— Victoria. MURRAY (R. A. F.), 1887.

—— Geological Survey and Maps. Reports, etc.
VICTORIA, 1854–61, 1869–83, p. 375.

—— Report of progress, 1874–84. VICTORIA. Add. 538.

—— Volcanic Rocks of the Ballarat District. KRAUSE, 1882.

—— Physiography and Geological Structure of the locality of Mount Buninyong. KRAUSE, 1882

—— (Western), Geological Survey. BROWN (H. Y. L.), 1872.

—— Report from the Government Geologist.
WESTERN Australia, 1871.

Bas Boulonnais. The lower Cretaceous Beds of.
TOPLEY (W.), 1868.

Belgium, geological map of. BELGIUM, 1880–81, p. 116.

—— and the French Ardennes. GOSSELET, &c., 1885.

Brazil. São Paulo Geological Commission. SÃO PAULO, 1887.

Canada, Elevations in. SPENCER (J. W.), 1884.

—— Geology SELWYN (A. R. C.) and Dawson, 1884.

—— Publications of the Geological Survey.
CANADA, pp. 216–217.

—— Stratigraphical Collection of Canadian Rocks.
FERRIER, 1893.

GEOLOGY (SPECIAL)—*continued.*

Quarternary Gravels. TYLOR (A.), 1869.
Rocks, Origin of. DELESSE, 1858, 1865
Rocks composing the surface of the earth. ORBIGNY, 1868.
Sand, Miniature Domes in Sand. READE, 1884.
Sandstone, Old Red. MILLER (Hugh), 1859.
—— Cause of the Coloration. READE, 1890.
—— Circulation of Water in. READE, 1884.
—— New Red Sandstone and the Physiography of the Triassic period. READE, 1889.
Secular Cooling of the Earth. READE, 1887.
—— Straining of the Earth in relation to the deep phenomena of Volcanic action. READE, 1890.
Sedimentation, Effect of, on the Temperature of the Earth's crust. READE, 1891.
Silurian System. MURCHISON, 1839.
Slickensides and Normal faults. READE, 1889.
Some New Red Horizons. LYMAN (D. S.), 1894. Add. 517.
Stalagmites of Sand. READE, 1891.
Subaërial Denudation, and on cliffs and escarpments of the chalk and the lower tertiary beds. WHITAKER (W.), 1867.
Technical Education, Geology as a branch of. CADELL (H. M), 1887. Add. 489.
Terrestrial Magnetism, connexion of Geology with. HOPKINS (E.), 1844, '51, '55.
Testimony of the Rocks. MILLER (Hugh), 1869.
Tidal action as a geological cause. READE, 1874.
—— As an agent of geological change. READE, 1888.
Trias Rounding of Sandstone grains of the. READE, 1892.
—— Trias of Cannock Chase. READE, 1892.
—— Physiography of the Lower Trias. READE, 1889.
Triassic Borings. DE RANCE, 1879.
—— Near Warrington. DE RANCE, 1880.
Valleys and their relation to Fissures, Fractures and Faults. KINAHAN, 1875.
Water in the interior of the Earth. DELESSE, 1861.

GEOLOGY (PLACES).

America (North and South). Denudation of the two Americas. READE, 1885.
America (North). Cambrian Faunas of N. America. WALCOTT (C. D.), 1884, '86.
—— Laurentian Limestones. HUNT (T. S.), 1871.
—— North American Bibliography for 1886. DARTON, 1887.

GEOLOGY (PLACES)—*continued.*

Great Britain. Bridgwater Railway. CLARKE (J. F. M.), 1891.
—— Buckinghamshire Geological Map. SMITH (William), 1824.
—— Chesil Bank, formation of. BRISTOW and Whitaker, 1869.
—— Chippenham. Strata and organic remains exposed in the cutting of Branch Railway from the Great Western line near. MANTELL (R. N.), 1850.
—— Cleveland, District of, North Yorkshire. BEWICK (J.), 1861.
—— Clwyd, Trias of the Vale of. READE, 1891.
—— Clyde and Forth, Glacial Beds of the. READE, 1880.
—— Clydesdale and Arran. BRYCE, 1859.
—— Colwyn Bay, Drift Deposits of. READE, 1885.
—— Cornish Rocks, Chemical Composition of. PHILLIPS (J. A.), 1871.
—— Cornwall. Geology. SYMONS (B.), 1884.
—— Cornwall, Devon, and West Somerset. DELABECHE, 1839; GEOLOGICAL Survey, 1839.
—— Cromer Forest Bed. READE, 1883.
—— Devon (North), Grouping of the Rocks of, and West Somerset. JUKES, 1867.
—— Dover, Straits of, excavations in, for Channel Tunnel. COLLADON, 1883.
—— —— Submarine exploration. POTIER and Lapparent, 1875–77.
—— Midland Counties, Triassic and Permian Rocks of. GEOLOGICAL Survey, 1869.
—— —— Triassic and Permian Rocks. HULL (E.), 1869
—— North-west Drift Beds. READE, 1874, '83.
—— St. David's, Pembrokeshire, Geology. READE, 1888.
—— South-east of England. MANTELL, 1833.
—— South-east, Geological relations at the beds between the Chalk and the Purbeck Limestone in. FILTON, 1833.
—— —— Geological map of. WHITAKER (W.) and Topley, 1870.
—— England and Wales. CONYBEARE and Phillips 1822; WOODWARD (H. B.), 1887.
—— —— Geological Map of. GREENOUGH, 1865.
—— English Channel. Submarine Geology off the coast of South Devon. HUNT (A. R.), 1881.
—— Eskdale Drift, and its bearing on glacial geology. READE (T. M.), 1893. Add. 530.
—— Fenland. GEOLOGICAL Survey, 1877; SKETCHLEY (S. B. L.), 1877.
—— Formby and Leasowe marine beds (section of the) and superior peat bed. READE, 1883.
—— Glamorganshire, Lower Lias, or lias conglomerate, of a part of BRISTOW, 1867.

GEOLOGY (PLACES)—*continued.*

Great Britain. Godalming, Lower Greensand of.
MEYER (C. J. A.), 1868.
—— Hastings Strata, Observations on. WEBSTER (Thomas), 1824.
—— Hertfordshire. Geology and Climate.
HOPKINSON (J.), F.L.S., 1887.
—— —— List of Works on. HOPKINSON (J.), F.L.S., 1885.
—— —— Silurian Rocks in Hertfordshire, and their relation to the Water-bearing strata of the London basin.
HOPKINSON (J.), F.L.S., 1880.
—— Holderness. GEOLOGICAL Survey, 1885; REID (Clement), 1885.
—— Hordwell Cliff, Hampshire. Freshwater formation in, and on the subjacent beds from Hordwell to Muddiford.
WEBSTER (Thomas), 1821.
—— Hull, Barnsley, and West Riding Junction Railway and Dock. COLE (E. M.), 1886.
—— Isle of Wight. BRISTOW, 1889; GEOLOGICAL Survey, 1889; and Coast of Dorsetshire. MANTELL, 1847.
—— —— Freshwater Formations in. WEBSTER (Thomas), 1814.
—— —— Tertiary Fluvio-marine formation. FORBES (E.), 1856; GEOLOGICAL Survey, 1856.
—— Kent (East), Geological changes in, since the Roman Conquest. DOWKER (G.), 1880. Add. 497.
—— Kent, Surrey, and Sussex. Map. KENT, 1868.
—— Lancashire and Cheshire, Post-glacial Geology of.
READE, 1871.
—— Leith, Edinburgh, and Glasgow, Mineral Survey on level line for a Canal between. PATERSON (J.), 1814.
—— Liverpool, Country around, and north of Flintshire.
MORTON (G. H.), 1891.
—— —— Notes on a few Borings and the base of the New Red Sandstone near. TIMMINS (A.), 1888–89.
—— London. HOPKINSON (J.), F.L.S., 1889.
—— —— Clapham and the neighbourhood of London.
PRESTWICH, 1857.
—— London. Geological Inquiry respecting the Water-bearing strata of the country round. PRESTWICH, 1851.
—— —— Jurassic Deposits which underlie London. JUDD, 1884.
—— London and Neighbourhood. GEOLOGICAL Survey, 1889; WHITAKER (W.), 1875, '89.
—— —— Notes on the surface geology. WHITAKER (W.), 1867.
—— London Strata. Sections. MYLNE (R. W.), 1850.
—— London and part of the Thames Valley, Geology of.
WHITAKER (W.), 1889.
—— Malvern Hills. PHILLIPS (J.), 1855.

GEOGRAPHY—*continued.*

Rocky Mountain Tourist. PANGBORN, 1878
Rome, Ancient. NARDINI, 1818.
—— Remains of Ancient Rome. BELLORIUS, 1673.
Russia, Advance of. ANDREW (Sir W. P.), 1886.
—— Its origin and development. BOULTON (S. B.), 1882.
San Francisco and back. RAE (W. F.), 1871.
São Paulo Geographical Commission. SÃO PAULO, 1889.
Satara Territory, Memoir of, 1857. INDIA, p. 130.
Scottish Geographical Magazine. PERIODICAL PUBLICATIONS, p. 24.
Shanghai Bund. Photographs and plans of American and English Settlements. SHANGHAI, 1866, 1891.
Sierra de Curá-malal (Currumalan). HOLMBERG, 1884.
Sikkim and Tibet. Convention between Great Britain and China, 1890. INDIA, p. 130.
Sinaloa. BUELNA, 1877.
Soissons-l'Abbaye de Saint Leger. LAPRAIRIE and Poquet, 1850.
Soudan, Eastern, and Central Africa, Policy. SOUDAN, 1885.
Seoul, Journey from, to the Phyŏng Kang Gold Washings. COREA, 1885.
Spain, Commercial and Industrial. HIGGIN, 1886.
Spain in 1866. HIGGIN.
Suez and its trade with the ports of the Red Sea. DASSY, 1859.
Suez, Isthmus of. BORDE, 1870.
Sumatra, West Coast. SUMATRA, 1883; VERBECK, 1883.
Sunderbund. Soonderbun Channels. INDIA, 1854, p. 132.
Sweden. DAHLBERG [circa 1700]; THOMÉE (G.), 1866.
Switzerland. BAEDEKER.
—— Swiss Baths. SWITZERLAND, 1830.
Terni. RICCARDI, 1818.
Tinnevelley District, 1878. INDIA, p. 132.
Tounghoo District, 1856. INDIA, p. 132.
Tripoli, Barbary. Trade and Commerce, 1870. HAY (D.), 1871.
Tunis, Journey to. BOTLEY, 1879.
Turkey in Asia. Undeveloped resources. AUSTIN (C. E.), 1878.
—— Some Notes on Turkey. TURKEY, 1867.
Turkey (Frontier of) and Persia. JONES (J. F.), 1857.
Turkestan. Visit to Kokan. KHOKAND, 1863.
United States. BROMLEY, 1876.
—— Western States and Cincinnati in 1826. BULLOCK, 1827
—— Cave Exploration in Eastern United States. MERCER (H. C.), 1894. Add. 520.
—— Expedition through the Big Horn Mountains, Yellowstone National Park, etc. Report. SHERIDAN (Gen. P. H.), 1882.

GEOGRAPHY—*continued.*

United States. Mason and Dixon's line. Boundary lines of the States of Maryland, Pennsylvania, and Delaware. GRAHAM (J. D.), 1862.

—— United States and Territories. Boundaries. GARNETT (H.), 1885.

—— Tourists' Guide. ALLAN Line, 1881.

—— Utah, Territory of. Report of Explorations across the Great Basin of the. UTAH, 1876.

—— Ute Country. Report of a reconnaissance in, made in 1873 by Ruffner. UTE Country, 1874.

Uruguay. Its geographical history, commerce, etc. URUGUAY, 1883.

Venezuela. HAWKSHAW, 1838.

—— Statistical Annuary of. VENEZUELA, 1884–87.

Wyoming, North Western. Yellowstone National Park, Reconnaissance of. JONES (Wm. A.), 1875.

Yellowstone Park. Annual Reports, etc. YELLOWSTONE Park, 1881, '83.

Zuiderzee. ZUIDERZEE-Vereeniging, 1892.

See also Topography.

GEOGRAPHY (GAZETTEERS).

Gazetteers and Dictionary of Geography. BROOKES, 1801; JOHNSTON (A. K.), 1877. Index Geographicus. JOHNSTON (A. K.), 1864; LIPPINCOTT (J. D.), 1893. Add. 515. WRIGHT (Rev. G. N.), 1834–35.

Geographic Dictionaries of Connecticut, Massachusetts, and Rhode Island. GANNETT (H.), 1894. Add. 502.

Geographical Dictionary of the World. LIPPINCOTT (J. D.), 1893. Add. 515.

—— Imperial Gazetteer. BLACKIE (W. G.), 1860, 1868.

—— Cyclopædia of India and of Eastern and Southern Asia. BALFOUR (E.), 1871.

India Imperial Gazetteer. HUNTER (Sir W. W.), 1881.

Indian Gazetteer. THORNTON (E.), 1893.

Library Cyclopædia of Geography. BRYCE and Johnston, 1880.

Pocket Gazetteer of the World. BARTHOLOMEW (J. G.), 1888.

Railway and Commercial Gazetteer of England, Scotland and Wales. MCCORQUODALE & Co., 1882, '94.

United States. Geographical Dictionary. COLANGE, 1884.

GEOGRAPHY (PHYSICAL). ANSTED, D. T. 1850; ANSTED, D. T. 1868; COOLEY (W. D.), 1876; SOMERVILLE (Mrs. Mary), 1849.

Brazil. Physical Geography. WELLS (J. W.), 1886.

GEOLOGY (PLACES)—*continued.*

Great Britain. Manchester. Sketch and Geological Essays. TAYLOR (John), F.R.S., 1864.

—— Mersey, Post-glacial geology of the Estuary of the. READE, 1872.

—— Norfolk, Geological observations on the eastern valleys of. ROBBERDS (J. W., Jun.), 1826.

—— Northumberland and Durham, Strata of, as proved by Borings and Sinkings, 1881. NORTH of England Institute.

—— Oxford and Valley of the Thames. PHILLIPS (J.), 1871.

—— —— Geological conditions affecting the Water Supply to houses and towns, with special reference to. PRESTWICH, 1876.

—— Plymouth District, Hydro-geology of the. INGLIS (J. C.), 1877.

—— Reygate Stone, and of the Fuller's Earth at Nutfield, Geognostical Situation of. WEBSTER (Thomas), 1821.

—— Scotland (Scenery of), viewed in connection with its physical geology. GEIKIE (Sir A.), 1865.

—— Shropshire and Cheshire, Ripple marks in Drift in. READE, 1884.

—— Sub-Wealden Exploration. Fourth Quarterly Report, 1873. SUB-WEALDEN Exploration.

—— Vyrnwy Valley, Glacial Geology of the. DEACON, 1889.

—— Wales (North) Coast, Drift Beds of the Moel Tryfaen area of. READE, 1893.

—— Weymouth and Isle of Portland. DAMON, 1860.

—— Yorkshire. PHILLIPS (J.), 1835.

—— Yorkshire Coalfield. GREEN and Russell, 1878.

—— Yorkshire Coast, Geological Survey of. YOUNG (Rev. G.), 1828.

—— —— Traverse of Yorkshire Drift. READE, 1883.

—— —— Geological Map. SMITH (William), Geologist, 1821.

—— —— Jurassic Rocks of. FOX STRANGWAYS, 1892.

India. Geological Survey Memoirs, Contents and Index of. THEOBALD (W.), 1892.

—— Reports, 1858–59, 1863–67. Memoirs, 1859, etc. Records, 1870, etc. Palæontologia Indica, 1861, etc. INDIA, pp. 101–2.

—— Catalogues of Cephalopoda, Echinodermata, and Meteorites in the Museum, 1865, '66, '68. INDIA, p. 101.

—— Kattyawar, South Coast, and Runn of Kutch. Memorandum on the Geological Action. SOWERBY (W.), 1867.

—— Manual of the Geology of India. MEDLICOTT (H. B.) and Blandford, 1893. Add. 519.

—— Geological Map. GREENOUGH, 1857.

GEOLOGY (PLACES)—*continued.*

India. Indian Museum, Calcutta. Catalogue of the remains of Pleistocene and Pre-historic Vertebrata. LYDEKKER, 1886.

—— Catalogue of the Remains of Siwalik Vertebrata. LYDEKKER, 1885–86.

—— Stratigraphical and structural Geology. OLDHAM (R. D.), 1893.

—— Summary. CARTER (H. J.), 1857.

—— Western India. Geological Papers, 1857. INDIA, p. 102.

—— Western India, including Cutch Sinde and the south-east coast of Arabia. CARTER (H. J.), 1857.

Ireland. HULL (E.), 1878.

—— Dublin and Wicklow Shelly-Drift. READE (T. M.), 1894. Add. 530.

—— Londonderry and parts of Tyrone and Fermanagh. GEOLOGICAL Survey, 1843; PORTLOCK, 1843.

Italy. Subterranean Treasures. JERVIS (W. P.), 1873–89.

Jamaica. Report. WEST Indies, 1869.

Japan. Hokkaido. Survey, 1874–76. MUNROE.

—— Geological Survey. Reports of progress, 1878–79. LYMAN.

—— Yesso, 1874, '77. LYMAN.

Liége, Province of. DUMONT (A. H.), 1832.

Namur. Minerals and fossils of the Namur province. CAUCHY, 1825.

New South Wales. Geological map of Hill End and Tambaroora. HILL END, N.S.W.

—— Sedimentary Formations of New South Wales. CLARKE (Rev. W. B.), 1878.

New Zealand. Canterbury Province. Survey. HAAST, 1864.

—— Formation of Canterbury Plains. HAAST, 1864.

—— Corals and Bryozoa of the Neozoic Period in. TENISON-WOODS (Rev. J. E.), 1880.

—— Reports of Geological Explorations, 1874, etc. NEW ZEALAND, p. 409.

—— Index to Reports of Geological Survey, 1866–85. NEW ZEALAND, p. 409.

—— Western districts of Nelson Province. Exploration. HAAST, 1861.

—— North Island. CRAWFORD (J. C.), 1865.

—— Palæontology. Corals and Bryozoa of the Neozoic period. NEW ZEALAND, p. 409.

—— Tertiary Molluska and Echinodermata, 1873. NEW ZEALAND, p. 409.

—— Formation of the Timaru District. GOODALL, 1886; HAAST, 1865.

GEOLOGY (PLACES)—*continued.*

New Zealand. Lower Waikato District. Geological Report. HUTTON (F. W.), 1867.

—— West Coast Exploration. HAAST, 1865.

Norber Brow and their levels, Perched Blocks of. READE, 1891.

Palestine Dynamic Geology. TAUNTON (J. H.), 1892.

—— Geology of Palestine. HUDLESTON (W. H.), 1885.

Rhineland between Basel and Mainz. OEYNHAUSEN, Dechen and La Roche, 1825.

Russia. Geology of Moscow. PETUNNIKOFF, 1886.

—— Russia in Europe and the Ural Mountains. MURCHISON, Verneuil and Keyserling, 1845.

Saint Gothard, Alpine Chain of. GIORDANO, 1872.

Spain. Rio Tinto Mines. Pyretic region of the Sierra Morena. COLLINS (J. H.), 1885.

—— Fossils. MALLADA, 1885–87.

Suez Canal. Geological Notice. SUEZ Canal, 1865.

Tyrol. Remarkable occurrence of Serpentine at the junction of Sienite with the Dolomite of the Tyrol. HERSCHEL (Sir J. F. W.), 1835.

Trinidad, Report on the Geology of. TRINIDAD, 1860; WALL (G. P.) and Sawkins, 1860; WEST INDIES, 1860.

United States. Geological Observations on the United States, Canada, and Nova Scotia. LYELL, 1845, '55.

—— Geological Map. HITCHCOCK (C. H.), 1886.

—— Geology of the Globe and of the U.S. in particular. HITCHCOCK (E.), 1854.

—— Neocene. DALL and Harris, 1891.

—— Relations of the Traps of the Newark System in the New Jersey Region. DARTON, 1890.

—— Sandstone: Junction between the Eastern and the Keweenaw Series. IRVING (R. D.) and Chamberlin, 1885.

—— Secondary Enlargement of Mineral Fragment in certain Rocks, 1884. IRVING (R. D.) and Van Hise.

—— Subaërial Decay of Rocks and origin of the Red Colour of certain formations. RUSSELL (I. C.), 1889. Add. 531.

—— Tertiary Rhynchophorous Coleoptera. SCUDDER (S. H.), 1893. Add. 533.

—— Agassiz (Lake). Upper Beaches and Deltas of the Glacial. UPHAM (W.), 1887.

—— Arkansas. Geological Reconnoissance of the Northern Counties of. OWEN (D. D.), 1858–60.

—— Baltimore, Maryland. Gabbros and associated Hornblende rocks occurring in the neighbourhood of. WILLIAMS (G. H.), 1886.

—— Bonneville (Lake). GILBERT (G. K.), 1890.

GEOLOGY (PLACES)—*continued.*

United States. California. New Cretaceous Fossils from. WHITE (C. A.), 1885.

—— —— Northern California. DILLER, 1886.

—— —— Southern California. Post-Pliocene Diastrophism of the coast of. LAWSON (A. C.), 1893. Add. 514.

—— —— Stratigraphy. BECKER (G. F.), 1885.

—— Carmelo Bay. LAWSON (A. C.) and Posada, 1893.

—— Colorado. Buffalo Peaks. EMMONS, 1883.

—— —— Colorado Formation and its Invertebrate Fauna. STANTON (I. W.), 1893. Add. 534.

—— —— Leadville. EMMONS, 1886.

—— —— Striking Products of Erosion in. ENDLICH, 1878.

—— Comstock Lode and Washoe District. BECKER (G. F.), 1882; UNITED States, 1882, p. 347.

—— Connecticut Geological Survey. SHEPARD (C. U.), 1837.

—— Dakota. Geology, mineral resources and mills of the Black Hills. DAKOTA, 1888.

—— Delaware, Gabbros and Associated Rocks in. CHESTER, 1890.

—— Elliott County, Kentucky, Peridotite of. DILLER, 1887.

—— Grand Cañon District, Tertiary history of the. DUTTON (C. E.), 1882.

—— Green Bay and the Wisconsin Territory to the Coteau de Prairie. Geological Reconnaissance, by way of. FEATHERSTONHAUGH, 1836.

—— Huron (Lake), Report on the north shore of. HURON, 1849.

—— Idaho and Wyoming, Jura Trias Section of. PEALE (A. C.), 1879.

—— Indiana. Geological Survey. Reports, 1870–72. INDIANA.

—— Kansas City, Clays and Building Stones of counties tributary to. LADD (G. E.), 1891.

—— —— South Western Kansas. Geological Reconnaissance. HAY (R.), 1890.

—— Lahontan, Crystallographic Study of the Thinolite of. DANA, 1884.

—— —— Geological history of Lake Lahontan (U.S. Geol. Survey, Monograph XI.). RUSSELL (I. C.), 1885.

—— Superior (Lake) and the Rocky Mountains. Altitudes between. UPHAM (W.), 1891.

—— Massachusetts and Narragansett bays, Country between. M'NEILL, 1832.

—— Michigan, Greenstone Schist areas of the Menominee and Marquette Regions of. WILLIAMS (G. H.), 1890.

—— Minnesota, Eruptive and Sedimentary Rocks on Pigeon Point. BAYLEY (W. S.), 1893. Add. 484.

GEOLOGY (PLACES)—*continued.*

United States. Missouri. Age and origin of the Crystalline Rocks. HAWORTH, 1891.

—— —— Geological Survey. BROADHEAD, Merk and Shumard.

—— —— Lower Carboniferous Crinoids from. MILLER (S. A.), 1891.

—— —— Reports of the Geological Survey, Missouri, 1855–71, Bulletins, 1890–91. Report of State Geologist, 1891. MISSOURI.

—— Montana. The Laramie and the overlying Livingston Formation in. WEED (W. H.), 1893.

—— —— Paleozoic Section in the Vicinity of Three Forks. PEALE (A. C.), 1893. Add. 527

—— Nanticoke disaster, 1886, Geologic relations of. ASHBURNER.

—— Nantucket Geology. SHALER (N. S.), 1889. Add. 533.

—— Nevada. Eureka District. HAGUE (A.), 1892.

—— —— Crystallisation in the Igneous Rocks of Washoe. HAGUE, A. and Iddings, 1885.

—— New Jersey. COOK (G. H.), 1868.

—— —— Agricultural Geology, United States, particularly New Jersey. DELESSE, 1880.

—— New Mexico. Volcanic Rocks from the Tewan Mountains. IDDINGS, 1890.

—— Ohio. Geological Survey Report, 1871. OHIO.

—— —— Geology. ANDREWS, E. B. and BALLATINE, 1870.

—— Pennsylvania. Geological Survey, 1886, etc. PENNSYLVANIA.

—— —— Glacial Boundary in Western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois. WRIGHT (G. F.), 1890.

—— Point Bonita, Eruptive Rocks of. RANSOME (F. L.), 1893. Add. 530.

—— Potomac Formation, Fossil Wood and Lignite of. KNOWLTON, 1889.

—— Quaternary Lakes of the Great Basin CALL, 1884.

—— St. Louis City and County, Clay, Stone, Lime, and Sand Industries of. LADD (G. E.), 1890.

—— Sioux (Great) Reservation, Lignites of. Report on the region between the Grand and Moreau Rivers, Dakota. WILLIS (B.), 1885.

—— Tennessee and adjoining districts. HULL (E.), 1891.

—— Texas. Present condition of knowledge. HILL (R. T.), 1887.

—— —— Texan Permian and its mesozoic types of Fossils. WHITE (C. A.) and Nicholson, 1891

GEOLOGY (PLACES)—*continued.*

United States. Tuscaloosa, Tombigbee, and Alabama Rivers, Tertiary and Cretaceous strata of the. SMITH (E. A.), and Johnson, 1887.

—— Utah, U.S.A., Report on the Geology of. UTAH, 1880.

—— Virginia. Geological Survey Reports. VIRGINIA, 1838.

—— Virginia and Kentucky. Geology of the Big Stone Gap Coalfield. CAMPBELL (M. R.), 1893. Add. 490.

—— Washington (Central), Geological reconnaissance in. RUSSELL (I. C.), 1893. Add. 531.

—— Washington Territory, Changes in River Courses in, due to Glaciation. WILLIS (B.), 1887.

—— Yellowstone and Missouri Rivers, Geological report of the Exploration of. YELLOWSTONE River, 1869.

—— Yellowstone Valley north of the Park, Glaciation of. WEED (W. H.), 1893.

Vienna, Tertiary formation in the neighbourhood of. KARRER, 1877.

GEOLOGY (PALÆONTOLOGY).

Account of Works published during the years 1875–89. PERIODICAL PUBLICATIONS. Add. 528.

New South Wales coal-fields. Palæozoic fossils. KEENE, 1867.

United States. California, Mesozoic and Cenozoic Paleontology of. WHITE (C. A.), 1885.

—— Eureka District, Palæontology of. WALCOTT (C. D.), 1884.

—— New Jersey and Connecticut Valley, Fossil Fishes and Fossil Plants of the Triassic Rocks of. NEWBERRY (J. S.).

GEOLOGY (PALÆONTOLOGY: FAUNA).

Bone Caves. SERRES, 1838.

Dinocerata. Extinct order of gigantic mammals. MARSH (O. C.), 1886.

Fossil Alcyonia. Some new varieties of. WEBSTER (Thomas), 1814.

Fossil Insects including Myriapods and Arachnids. Our present knowledge of them. SCUDDER (S. H.), 1886, '90.

Laramie Molluscan Fauna, Relation of, to that of the succeeding Freshwater Eocene and other groups. WHITE (C. A.), 1886.

Thesaurus Siluricus. Flora and fauna of the Silurian period. BIGSBY, 1868.

Ventriculidæ of the chalk, their microscopic structure, affinities, and classification. SMITH (Joshua Toulmin), 1848.

America. Marine Mollusca. DALL, 1885.

—— North American Invertebrate Palæontology, Supplement to the bibliography of. WHITE (C. A.) and Nicholson, 1879.

GEOLOGY—(PALÆONTOLOGY: FAUNA)—*continued.*

America. Jurassic Freshwater invertebrates of. WHITE (C. A.), 1886

—— Paleozoic Crustacea from 1698 to 1889 including a list of N. American species, etc., Bibliography. VOGDES (A. W.), 1890.

—— Paleozoic Fishes of North America. NEWBERRY (J. S.).

America (Western North). Marine Eocene, Freshwater Miocene, and other fossil Mollusca of. WHITE (C. A.), 1885.

Borneo. Fossil Mollusca of the Eocene. BORNEO, 1877.

Europe and North America, Extinct Vertebrata of. Fauna of the Miocene Tertiaries of Oregon. COPE, 1879.

Great Britain. Asterolepis of Stromness. MILLER (Hugh), 1869.

Pacific. Invertebrate Fossils from the Pacific Coast. WHITE (C. A.), 1889.

United States. Mesozoic Echinodermata of the United States. CLARK (W. B.), 1892; CLARK (W. B.), 1893. Add. 492.

—— Idaho (South Western), Fossils of the Jura Trias of. Conditions of Preservation of Invertebrate Fossils. WHITE (C. A.), 1879.

—— New Jersey. Brachiopoda and Lamellibranchiata of the Raritan clays and greenstone marls of. WHITFIELD (R. P.), 1885.

—— Gasteropoda and Cephalopoda of the Raritan Clays and Greensand Marls of. WHITFIELD (R. P.), 1891.

—— New Mexico. Systematic Catalogue of Vertebrata of the eocene of New Mexico. NEW MEXICO, 1875.

—— New York, Fossil Fauna of the Upper Devonian. The Genesee Section of. WILLIAMS (H. S.), 1887.

—— Rhode Island Coal Field. Insect fauna. SCUDDER (S. H.), 1893. Add. 533.

—— Tompkins County, N. Y., to Bradford County, Pennsylvania, Fossil Fauna of the Upper Devonian, along the meridian of 76° 30' from. WILLIAMS (H. S.), 1884.

GEOLOGY (PALÆONTOLOGY: FLORA).

Types of Laramie Flora. WARD (L. F.), 1887.

Vegetable Fossils of the Auriferous Drifts. MUELLER, 1883.

Portugal. ANONYMOUS (Relatorio), 1868, p. 54.

United States. Illustrations of Cretaceous and Tertiary Plants. UNITED States. 1878, p. 347.

—— Missouri, Flora of the outlying carboniferous basins of South Western. WHITE (D.) 1893.

—— Potomac or Younger Mesozoic Flora. FONTAINE, 1889.

—— Virginia Older Mesozoic Flora of. FONTAINE, 1883.

Yellowstone National Park, Fossil Forests of the Volcanic tertiary formations of the. HOLMES (W. H.), 1879.

GEOMETRY. *See* MATHEMATICS.

GERMS. *See* BACTERIA.

GILDING. New Processes in the Art of the Gilder.
ACADÉMIE des Sciences, 1842.

GIRDERS. PHIPPS, 1881.

Bowstring girders without vertical members.
ENGESSER (F.), 1880.

Construction. BAKER (W. L.), 1892.

Continuous girders. Arched ribs and tension circles.
GUTHRIE (F.), 1878.

Continuous web girders and Braced Girders.
UNWIN (W. C.), 1868.

Effect of impact on Girders. FAIRBAIRN (Sir W.), 1866, p. 403.

Iron beams or girders. Fielder's patent for improvements in construction. BAKER and Son.

Iron girders, Design of, with open webs. KERNOT, 1883.

—— Wrought Iron Girders, effect of impact, vibratory action, and long continued changes of load.
FAIRBAIRN (Sir W.), 1864, p. 401.

—— Fielder's patent, for improvements in construction.
BAKER and Son.

—— Wrought Iron and Steel Girders, graphic table for facilitating the computation of the Weights of.
BUCK (J. H. W.), 1883

—— Improvements in constructing wrought iron Girders.
ARROL, 1877.

—— New method of graphic statics applied in construction.
OLANDER, 1880.

—— Principles of Mechanics applied to Wrought iron girder work.
LATHAM (J. H.), 1858.

—— Weights up to 200 feet span. BAKER (Sir B.), 1875.

Jointed Bow Girders. General Theory. WERNER (E. A.), 1888.

Lattice and Plate Girders. Their relative deflection.
STONEY (B. B.), 1863.

Mechanics of the Girder. CREHORE, 1886.

Strains in Riveted Girders. Simple and practical method of obtaining, by diagrams. TIMMINS (T.), 1882.

—— Strains in Girders. STONEY (B. B.), 1866–69, 1873, 1886.

Stresses in Girder and Roof Trusses for both dead and live loads by simple multiplication, etc.
JOHNSON (F. R.), 1894. Add. 512.

—— Examples of the calculation of stress in, by graphic and algebraic methods. UNWIN (W. C.), 1869, p. 360.

Theory and Calculation of Girders. ENGESSER, 1880.

See also BEAMS.

GLACIERS.

Glaciers of the Alps. Origin and phenomena of glaciers and the physical principles to which they are related. TYNDALL (J.), 1860, p. 334.

Studies on Glaciers. AGASSIZ, 1840.

Theory. FORBES (J. D.), 1847–48, 1859.

GLASS.

Art of painting on glass or glass staining. GESSERT, 1844; LE VIEIL, 1780.

Electrostatic capacity of Glass. HOPKINSON, (J.), 1877, '80, '81.

Furnaces for the manufacture of Glass on the open hearth. HEAD (J.), 1886.

Glass and Silicates. BEVAN (G. P.). Industries, vol. 7.

—— Silicates, Silicides, glass and glass painting. BARFF, 1872.

Glass Tubes, Experiments relating to the action of, upon water and quicksilver. JURIN (J.), 1719. App. 563.

Manufacture. BENRATH, 1875; PELLATT (A.), 1821, '49.

—— For optical purposes. FARADAY (M.), 1830.

Nature and physical history of Glass. BRAYLEY, 1845.

Optical Glass prepared by Dr. Ritchie. SIMMS (W.), 1840.

Principles. POWELL (H. J.), 1883.

—— Crown and sheet glass. POWELL (H. J.), 1883.

—— Plate Glass. POWELL (H. J.), 1883.

Refractive Indices of glass. HOPKINSON (J.), 1877.

Writing on Glass. A glaze to facilitate this. TERQUEM (A.), 1876.

GLOBES.

Armillary sphere. SLATER (J. S.), 1890.

Globes celestial and terrestrial, How to use. MOXON (J.), 1670. App. 569.

GLUE (Marine). JEFFERY, 1843. French Commission at Toulon, 1845. FRANCE, p. 439.

GOLD. O'BRIEN, 1884; STREETER (E. W.), 1877.

Chlorination process for gold-bearing sulphurets. KÜSTEL, 1868.

—— Thiess process of Barrel Chlorination. EGLESTON, 1890.

Geology. CALVERT, 1853.

—— Chemical Geology of goldfields of California. PHILLIPS (J. A.), 1868.

England. Gold Supply. CORNISH (T.), 1887.

Hydraulic Gold-Miner's Manual. KIRKPATRICK, 1890.

Losses in Amalgamation. MCDERMOTT and Duffield, 1890.

Metallurgy. EISSLER, 1888; PERCY (J.) 1880; ROSE (T. K.), 1894.

GOLD—*continued.*

Metallurgy. In the United States. EGLESTON, 1887, '90.
Milling (Gold) Handbook. LOUIS, 1894.
Nevada and California Processes of gold extraction. KÜSTEL, 1868.
Occurrence and extraction. LOCK (A. G.), 1882.
Pyrites, best means of treating, on goldfields. VICTORIA, 1874, p. 376.
Refining California gold by the Zinc method. M'CULLOH (R. S.), 1852.
Rocks, Gold-bearing, of the World, Geology of. HOPKINS (E.), 1853.
Treatment in the Arrastra. EGLESTON, 1887.
Treatment of Fine Gold in the Sands of Snake River, Idaho. EGLESTON, 1890.

GOLD MINES.

Gold regions of the world. CALVERT, 1853.
Gold working. BEVAN (G. P.). Industries, vol. 11.
Gold-seeker's Manual. ANSTED (D. T.), 1849.
Vertical structure of the Primary Rocks and general character of their gold-bearing varieties. HOPKINS (E.), 1856.

Africa and America. Confirmation of laws and liberties to all the King's subjects. HOUGHTON, 1694.
—— South Africa. EDWARDS (D.) and Co., 1890; MATHERS, 1887; REUNERT (T.), 1893.
—— South and East Africa. INGRAM (J. F.), 1889.
—— Discoveries in the Division of Knysna, S. Africa. BAIN (T.), 1886.
—— S. Africa, Lydenburg goldfield. Map. LOVEDAY, 1883.
Australia. FAIRFAX, 1852. Discovery of gold. EARL, 1853. From 1860 to 1871. CLARKE (Rev. W. B.).
—— Deposits in Australia. DAVISON, 1860.
—— Geology of Australian Goldfields. WATHEN (G. H.), 1855.
—— Lectures for instruction of emigrants to Australia. JUKES, etc., 1852.
—— South Australia, Gumeracha and Mount Crawford Goldfields. Geological Map. SOUTH AUSTRALIA, 1887, p. 227.
—— Ulooloo. Goldfield Report. SOUTH AUSTRALIA, 1887, p. 227.
Brazil. Minaes Geraës. MOUNTENEY, 1825.
California. Chemical geology of Goldfields of California. PHILLIPS (J. A.), 1868.
California, Russia, India, Brazil, etc. DAVISON, 1860.
Chili. British Capital. GANA, 1889.
Cleveland (Mount), Specimen Gold Reef near, and Corunna Gold Field. CLEVELAND, 1884.
Great Britain and Ireland Gold Rocks. CALVERT, 1853.
Guiana, South America. Reports. GUIANA, 1881.

GOLD MINES—*continued.*

Guiana, South America. Plan of Gold Mines in French Guyana, 1888. GUIANA, 1888.
India. BALL (V.), 1881.
—— Examination of gold dust and gold from Shuy-Gween, 1853. INDIA, p. 130.
—— Southern India. Notes on some of the auriferous tracts of Mysore province. ATTWOOD (1888).
Japan. Yesso. MONROE, 1875.
Montana Company. Report, 1886. MONTANA Co.
New Zealand. Reports, 1869–75. NEW ZEALAND, p. 410.
—— Supply of water, 1871. NEW ZEALAND, p. 410.
Nova Scotia. HEATHERINGTON, 1871, '73.
—— Report, 1863. NOVA SCOTIA
Otago. Construction of reservoirs. Report. OTAGO, 1868.
Queensland. Mount Morgan Gold Mine, Rockhampton. MOUNT MORGAN, 1885.
Queensland. Report, 1892. QUEENSLAND.
Sierra Nevada, Auriferous Gravels of. WHITNEY (J. D.), 1880.
Tasmania, Black Creek Gold Field. BLACK CREEK, 1882.
—— Den Gold Field. Mineral Resources and Permanency. DEN Gold Field, 1882.
—— Gold Fields Regulation Act, 1880, and the several Acts amending the same. TASMANIA.
—— Linda Goldfield. Auriferous and other Mineral Deposits. Report. LINDA, 1886.
—— Mineral resources and permanency of the Lefroy Gold Field. LEFROY Gold Field, 1882.
Transvaal. Auriferous Conglomerate. COLLINS (H. R.), 1888.
—— Gold Fields. STUART (J. M.), 1883.
Venezuela. Gold Mining Prospects, and a guide to the Guayana Goldfields. WEARS (W. G.), 1888.
Victoria. HOPKINS (E.), 1853; SMYTH (R. B.), 1869.
—— Statistics, Acts, etc., 1859–64, 1884–91. VICTORIA, pp. 376, 377.
Witwatersrand Gold Fields, South Africa. Description. WILLIAMS (T. D.), 1891.
Wynaad and Carcoar Ghat Gold Mines. SMYTH (R. B.), 1880.

GOLD MINING.

Mining and Metallurgy. PHILLIPS (J. A.), 1867.
Union Gold Mining Company of Virginia. Report. UNION Gold Mining Co., 1835.
Victoria. Removal of Sludge, 1859. VICTORIA, p. 376
Witwatersrand Chamber of Mines. Reports, 1890, etc. WITWATERSRAND Chamber, 1892.

GOLD ORES.

Leaching Gold Ores containing Silver. EGLESTON, 1886.

Origin and occurrence of Gold-bearing Gravels, Rocks, and Ores. LOCK (C. G. W.), 1889.

Roasting Gold Ores, Losses in, and the volatility of Gold. CHRISTY (S. B.), 1889.

Roasting and extraction of the Metal without Quicksilver. KÜSTEL, 1880.

Treatment. O'DRISCOLL, 1889.

United States. Leaching Gold and Silver Ores in the West. EGLESTON, 1883.

GOLD AND SILVER.

Amalgamation. EGLESTON, 1884.

Doctrine of Gold and Silver Computations. SNELLING (T.), 1766. App. 577.

Gold and Silver Mining Company (Alice), Butte, Montana. Report on the Property. MAYNARD, 1882.

Parting Gold and Silver, by means of Iron, at Lautenthal. EGLESTON, 1885.

—— In California. EGLESTON, 1882.

—— In the United States Assay Office, New York City. EGLESTON, 1885.

—— In the United States Mint at Philadelphia. EGLESTON, 1886.

Pliny's Natural History of Gold and Silver. DURAND (D.), 1729. App. 555.

Scamander Silver and Gold Deposits. Report. THUREAU (G.), 1886.

United States. Treatment at the United States Mint. EGLESTON, 1886.

—— Report of the Director of the Mint upon the production of the Precious Metals. UNITED STATES, 1886, etc., p. 351.

Worker's Guide. BLOEDE, 1867.

GOVERNMENT.

Aid to Art, Science, and Literature. DONALDSON (T. L.), 1838.

Beneficent Government: an Essay on. VISHNUBAWA Brahmachari, 1869.

England, Constitution of. LE PLAY and Delaire, 1875.

India. Administration of the several Presidencies and Provinces of British India. INDIA, p. 98.

—— Lord Dalhousie's Administration 1848–56. INDIA, p. 99.

Province of Government. PLEYDELL BOUVERIE, 1884.

Representative Government. International Question. MARCOARTU, 1874, '84.

—— Spain. MARCOARTU, 1886.

Uses and Abuses. COXWORTHY, 1852.

GOVERNORS FOR STEAM ENGINES.
Buss Governor. DWELSHAUVERS-Dery, 1872.
Centrifugal governors, graphical analysis. HERRMANN, 1886.
Drum governor. DWELSHAUVERS-Dery, 1872.
Hydraulic Motion. Regulator or Governor. PITCHER, 1852.
Improved governor. HICK (B.), jun., 1841.
Mohn governor. DWELSHAUVERS-Dery, 1890.
New theory. BEER and Dwelshauvers-Dery, 1877.
Watt's governor. RAFFARD, 1893.

GRAIN.
Improvements in appliances for facilitating the discharge of Grain and Bulk Cargo from Ships. LYSTER (G. F.), 1880.
Improvements in Portable Elevators for Grain and like Cargo. LYSTER (G. F. and A. G.), 1885.
Pneumatic Grain Elevator and Conveyor. DUCKHAM, 1894.

GRANITE.
Block of Granite from the Salcombe Fishing Grounds. HUNT (A. R.), 1876.
Concretionary patches and fragments of other Rocks in Granite. PHILLIPS (J. A.), 1880.
Effects of contraction during the cooling of intrusive masses of Granite. READE, 1894.
Granites and Granite Industries. HARRIS (G. F.), 1888.

GRAVITATION. AIRY (Sir G. B.), 1838, p. 17.
Determination of Gravity, with half-second Pendulums, on the Pacific Coast, at Alaska. MENDENHALL, 1892.
Effect of Gravity. DE PENNING, 1885.
Gravitation considered as a Mechanic Power. CUMMING (A.), 1802. App. 553.
Natural phenomena referred to Newtonian laws. SEGUINAINÉ, 1861.
Universal Gravitation. WHEWELL (W.), 1832; PRATT (J. H.), 1836.

GUANO BEDS in Peru. DURAND-CLAYE, 1875.

GUN CARRIAGES. *See* ARTILLERY.

GUNPOWDER. *See* EXPLOSIVE AGENTS.

GUTSPINNERS' ART. LA BARROQUE (A. G.), 1822. App. 565.

GUTTA PERCHA. BEVAN (G. P.), Industries, vol. 9.

GYROSCOPE, Phenomena of. BARNARD (J. G.), 1858.
Spinning Tops. PERRY (Prof. J.), 1890.

H.

HARBOURS. ANONYMOUS, p. 42; BRECKENRIDGE, 1885; PRICHARD (W. B.), 1844. Add. 529.

Accommodation Harbour. BATEMAN (J. F. La T.), 1871.

Bar (Harbour). D'AURIA (L.), 1889. Add. 495; HAUPT (L. M.), 1889; PRICHARD (W. B.), 1844. Add. 529.

Constructing, Method of. REDFERN, 1888.

Design and Construction. STEVENSON (T.), 1856, 1864, 1874, 1886.

Equipment, modern. SCHEMFIL, 1882.

Harbour building. HAGEN (G.), 1863.

Hydrographical Engineering as applicable to Harbours, etc. SLEIGH (Capt. R.), 1859.

Marine Works, Construction of, with artificial blocks of large size. STONEY (B. B.), 1874.

Military and Refuge Harbours. COODE (Sir J.), 1875.

National Harbours. CALVER, 1876.

Natural and Artificial. CHEESEWRIGHT, 1891.

Physical features, history, construction, etc. VERNON-HARCOURT (L. F.), 1885.

Physical Phenomena of Harbour Entrances. HAUPT (L. M.), 1887.

Planning and construction of harbours in deep water. BREMNER, 1845.

Refuge, Harbours of. GLOVER (F.R.A.), 1846, 1859; LOVELACE, 1849; MATHER, 1858; RICHARDSON (T.) and Jaffrey, 1859.

—— Bays of Refuge for vessels in Storms. BAIN (D.), 1857.

—— Formation of Harbours of Refuge. CALVER, 1858; TAYLER (Capt. J. N.), 1840; WHITE (John), 1840.

—— Proposal for a floating Harbour of Refuge. McCOSH, 1882.

—— Harbours of Refuge and Breakwaters in the Channel. Quarterly Returns of Engineers, 1850–74. PARLIAMENTARY..Papers, p. 480.

—— —— Report of Select Committee, 1836. PARLIAMENTARY..Papers, p. 480.

—— —— Report of Select Committee, 1857–58. PARLIAMENTARY..Papers, p. 480.

—— —— Royal Commission. Evidence, 1858; Report, 1859. PARLIAMENTARY..Papers, p. 480.

—— —— Remarks on Supplementary Report. ABERNETHY, 1859.

—— —— Observations on certain portions of the Reports. SCOTT (M.), 1859, p. 176.

HARBOURS—*continued.*

Refuge, Harbours of. Memorandum of the Board of Trade, 1860, '62. PARLIAMENTARY..Papers, p. 480.
—— Correspondence between the Board of Trade and other departments of Government, 1864. PARLIAMENTARY..Papers, p. 481.
—— Report on Harbours of refuge, shipwrecks, etc. ST. GEORGE'S Harbour and Railway Co., 1836.
Reports of the Board of Trade on the General Pier and Harbour Acts. PARLIAMENTARY..Papers, p. 481.
Report on Passive Obstructions for the defence of Harbours and Channels, 1866. PARLIAMENTARY..Papers, p. 481.
Transport: a review of...Harbours, etc. PERIODICAL PUBLICATIONS, p. 25.
Trusts (Harbour) Constitution. SCHÖNBERG (A. C.), 1886.

Aberdeen. Act for improvement. ABERDEEN Harbour, 1810–29.
—— Committee on Bill. 1828. ABERDEEN Harbour.
—— Reports by Smeaton, Rennie, and Telford, 1834. ABERDEEN Harbour.
—— Reports. WALKER (James), 1838, p. 393.
—— Extension of North Pier and improvement of the Harbour Entrance. ABERDEEN Harbour, 1876.
—— Committée on Bill, 1839. ABERDEEN Harbour.
Adelaide (Port). Best means of giving accommodation to large Ocean Steamers at or near it. SOUTH Australia, 1878, pp. 227, 228.
Africa (South). Harbour Works. Report. EAST LONDON, 1868.
—— East London, Port Elizabeth, and Kourie Harbour Works. Papers. EAST LONDON, 1868.
Aldborough Harbour of Refuge Bill. ALDBOROUGH, 1852.
Alderney. SHERINGHAM (W. L.), 1872.
Report of Select Committee. ALDERNEY, 1872.
Algoa Bay. Improving the Port and Harbour. ALGOA BAY, 1877–80.
Altona. Deepening of the Elbe. HÜBBE, 1851.
American coast, removal of bars. PUTNAM (J. R.), 1841.
Anstruther. Correspondence. ANSTRUTHER, 1871.
Antwerp, its importance, etc. ROYERS (G. A.), 1879.
—— A Description, etc. ROYERS (G. A.) and others, 1885.
Appledore, Bideford and Barnstaple. Reports. APPLEDORE HARBOUR, 1848.
Ardrossan Harbour Act. ARDROSSAN, 1805.
Arklow. Reports. ARKLOW, 1886.
—— Improvement and the practicability of a navigation from thence. CHAPMAN (W.), 1792, p. 242.

HARBOURS—*continued.*

Athens. Topography of the Harbours, and position of the Long Walls of Athens. ULRICKS (H. N.), 1847.

Australia (South). Harbours and Jetties Engineer. Report. SOUTH Australia, 1878, p. 227.

—— Outer Harbour Accommodation, Estimated Cost. SOUTH Australia, 1878, 1879, p. 227.

—— —— Formation of. Letter of advice. SOUTH Australia, 1878, p. 227.

—— Port Harbour Commission Report. SOUTH Australia, 1866, p. 227.

—— Shipping Accommodation (Increased), Estimates for. SOUTH Australia, 1878, p. 228.

Ballyshannon. Report of improvement of. STEVENSON (R.) and Son, 1832.

Batavia, Tandjong Priok. BATAVIA, 1876, 1888.

Beitkul in Sedashigur Bay. Harbour, 1858. INDIA, p. 110. Improved Harbour Works. LATHAM (G.), 1862.

Belfast, history. BELFAST, 1852.

—— Harbour and Dock Accommodation. BELL (R. B.) and Miller, 1862.

—— Improvement, plans for. CUBITT (Sir W.), 1835; CUBITT (Sir W.), 1835. Add. 494.

—— Report on the improvement of. WALKER (James) and Burges, 1830. Report. HAWKSHAW, 1870. Plan. WOODHOUSE (T. J.), 1834; WOODHOUSE (T. J.), 1834. Add. 539.

Belgium and France. Report to the Dutch Government. BELGIUM, 1864, p. 116.

—— Belgium and other low sandy coast harbours. Means of improving. VERNON-HARCOURT (L. F.), 1881.

Berwick-on-Tweed. Fishery Harbour at Green Haven. Report. SANDEMAN (J. W.), 1882.

Bombay. Proposed road through the reclamations on the harbour side. AITKEN (R.), 1866.

—— Harbour and Dock trust, proposal for establishment of. AITKEN (R.), 1867.

—— Lighting up of the entrance. BARKER (W. C.), 1863; 1866. INDIA, 1886, p. 112.

—— Deep Water Basins, 1872. INDIA, p. 112.

—— Deep Water Berthage for Ships and Steamers. FRASER (A.) and Ormiston, 1872.

—— Bombay Harbour and Pilotage Board Reports, 1863–73, etc. INDIA, p. 112.

—— Survey, 1875. INDIA, p. 111.

Boston, Lincs. Act for improving the harbour, 1812. BOSTON.

HARBOURS—*continued.*

Boston, Lincs. Reports of Engineers, 1800-1877. BOSTON.
—— Improvement of Boston Harbour and Outfall. HAWKSHAW, 1864.
—— Improvement of Port and Harbour. HUDDART, 1800.
—— Improvement of Boston Haven. CHAPMAN (W.), 1800, p. 241; RENNIE (Sir J.), 1822.
—— Report on the Sea-Wall for the preservation of Ram Head. THAYER (Col. S.), 1844.
Bremen. Formation of the new harbour. FRANZIUS, 1888.
Bridlington Harbour. Minutes of Evidence, 1837. BRIDLINGTON.
Brindisi. Re-opening. PIGONATI, 1781.
Brisbane. Extension of Harbour accommodation. BRISBANE, 1878.
Bristol. Plan for improving the harbour. BRISTOL, 1802.
Broadstairs. Act for repairing or removing the pier. BROADSTAIRS, 1805.
Calais Harbour Works. CALAIS, 1889.
—— Inauguration, 1889. CALAIS.
Calcutta, Proceedings relative to, 1838. INDIA, p. 114.
Cape Colony. Inspection of Harbours by Sir John Coode. CAPE Colony, p. 221.
Cape Town. Report on the safety of the port of Table Bay. CAPE Town, 1854.
—— Eastern Harbour Works. CAPE Town, 1867
Cette. BENSAUDE (J.), 1885.
Charleston, Engineer and Artillery Operations against the defences. GILLMORE (Q. A.), 1868.
Chester. Improvement of port and harbour. CHESTER, 1839.
—— Chester Port and Harbour. RENNIE (Sir J.), 1837.
—— Chester Improvements. RUSSELL (John S.), 1838.
Chicago Harbour and Bar, Illinois. GRAHAM (J. D.), 1857.
Colombo Harbour Works, 1872–81. INDIA, p. 117.
Copenhagen. Plan for the development of. COPENHAGEN, 1878, '81.
Cork harbour and river. BARRY (P.), 1874.
—— Means of improving the River and Harbour. NIMMO, 1815.
—— Report on the River Lee. BENSON, 1872.
—— Reports on state and capabilities of the River and Harbour. NIMMO, Killally and Owen, 1845.
Crail. Proposed Asylum Harbour. LESLIE (J.), 1846.
Dartmouth. Advantages as a port for the departure and arrival of mails. DARTMOUTH Harbour, 1864; HOLDSWORTH (A. H.), 1841.
Denmark. Harbours and Ferry System. CAREY, 1893.

HARBOURS—*continued.*

Diamond Harbour on the River Hooghly. Proposed docks. BOILEAU (J. T.), 1839.
—— Wet Docks, 1882. INDIA, p. 118.
Douglas Bay, Isle of Man. Proposed formation of a Low Water Asylum Harbour. RENNIE (Sir J.), 1835.
Dover. Proposed national harbour. CALVER, 1875.
—— Report from Select Committee on Harbours. DOVER, 1836.
—— Harbour of Refuge to be constructed. DOVER, 1846.
—— Reports. DOVER, 1845, 1848.
—— Specifications. DOVER, 1860.
—— Admiralty Pier. DOVER, 1860. Wasting of the shore to the eastward of the Pier. DOVER, 1873. Damage by the storm of 1st Jan., 1877. DOVER, 1878.
—— New Harbour. HOSEASON, 1874.
—— History. JONES (J. B.), 1892. Add. 512.
—— Employment of Convicts, 1883. PARLIAMENTARY..Papers, p. 473.
—— Proposals for rendering the ports of Dover and Dublin commodious for large ships. PERRY (Capt. J.), 1721.
—— Proposed enclosure of Dover Bay. REDMAN (J. B.), 1875.
—— Report. SMEATON (J.), 1769.
—— Proposed plan for improving, by an extension of the south pier head. WORTHINGTON (B.), 1838.
Drogheda. Report. BALD (W.), 1837.
—— Improvement of Harbour and River. NIMMO, 1826.
Dublin. Improvement and deepening of the Bay and Harbour of Dublin. BEAUMONT (F. W.), 1839.
—— Letter. DUBLIN, 1814
—— Report to Commissioners. CUBITT (Sir W.), 1835.
—— Dunleary Asylum Harbour. DUBLIN, 1816.
—— Howth, Harbour erecting at. DUBLIN, 1811.
—— Letter to Directors General of Inland Navigation concerning Harbour of Dublin. DUBLIN, 1805.
—— Practicability of making an artificial Harbour. JESSOP, 1800.
—— Report. PAGE (Sir T. H.), 1801.
—— Observations on reports for its improvement. ROGERS (T.), 1805.
—— Report, etc. WALKER (James), 1861, p. 393.
Dundee Harbours. Reports, 1814, 1821, 1855. DUNDEE; LESLIE (J.), 1843
—— Arbitration. CARSTAIRS, Mitchell and Co., 1863
—— Improvement. GUILD, 1814
—— Improvement and prospective extension, 1855. LESLIE (J.).

HARBOURS—*continued.*

Dundee Harbours. Reports, etc., 1885. LESLIE (J.).
—— Improvement and Extension of the Harbour. OWER, 1855; OWER and Leslie, 1854.
—— Report on its improvements. STEVENSON (R.), 1822.
—— Report. TELFORD (T.), 1814, p. 287.
—— Report on embanking the shore or bed of the River Tay. WALKER (James), 1845, p. 339.
Dunedin, N.Z. Correspondence relating to the reclamation of. DUNEDIN, 1878. Add. 497.
Dunmore, Estimate and Act for improving. DUNMORE, 1814–18.
Dynllaen (Port). Survey, 1837. LIVERPOOL, p. 246.
—— Port Dynllaen Harbour. Report. PORTHDYNLLAEN Harbour, 1838.
England. Harbour Accommodation in the West of England. INGLIS (J. C.), 1885.
—— British and Foreign Harbours. RENNIE (Sir J.), 1854.
—— Channel Refuge—Harbours and Naval stations. BROOKS (W. A.), 1856.
—— Harbour for the downs in England. Plan for it. SEMPLE (G.), 1776, 1780.
—— Harbours of England. TURNER (J. M. W.), and Ruskin, 1856.
—— Harbours of Great Britain. BARTLETT (W. H.), etc.
—— South Eastern Coast. PORTWINE, 1849. Report of Commissioners, 1840. PARLIAMENTARY..Papers, p. 480. Plans for Improvement. PRICHARD (W. B.), 1844. Add. 529.
—— Memorandum on proposals in the Provisional Orders in the Pier and Harbour Orders Confirmation Bills, 1888. PARLIAMENTARY..Papers, p. 481.
—— Plans of Harbours, Bays and Roads in St. George's and the Bristol Channels. MORRIS (W.), 1801.
—— Report on Harbour Accommodation, 1883–84. PARLIAMENTARY..Papers, p. 481.
—— Return of Harbour Authorities, 1883. PARLIAMENTARY..Papers, p. 481.
—— Tidal Harbours Commission. Report, 1845–47. Opinions of Harbour Boards, etc., 1847. PARLIAMENTARY..Papers, p. 480.
Falmouth. Reports. PRICE (H. H.), 1835. CUBITT (Sir W.), 1835.
Famagusta, Cyprus, proposed improvements. FAMAGUSTA, 1880.
Flushing. Projected International Communication in the north and east of Europe. MULVANY (W. T. and T. R.), 1873.

HARBOURS—*continued.*

Frankfurt Harbour Works. PULS (O.), 1886.
French Harbour Works. WATSON (William), 1892.
Galveston, Improvement of. EADS, 1884.
Glasgow. DEAS, 1876, '81. Plans. DEAS, 1876.
—— Improvement. BELL (D.), 1837; LOGAN, 1835.
—— Report on the Extension of. URE (J. F.), 1854.
—— Report to the Parliamentary Trustees for enlarging. WALKER (James), 1841, p. 394.
Granton. Report. STEVENSON (R.) and Son, 1834.
Grasbrook Harbour establishment. HAGEN (G.), 1858; HAMBURG, 1858.
Greenock. Proposed Harbour. GREENOCK, 1868. Harbours. METHVEN, 1886.
Greenway Breakwater, Small Harbour of Refuge. THOMAS (E. C. G.), 1880.
Greymouth, New Zealand. Protective Works. GREYMOUTH, N.Z., 1872.
Gris-Nez, Port. Creation of an arsenal and maritime port at. CAMBRELIN, 1889.
Hartlepool (West) Harbour and Docks. Acts and Reports. HARTLEPOOL, 1850.
—— Report. HARTLEPOOL, 1850. Add. 505.
Harwich. Accounts, 1873–88. HARWICH Harbour.
—— State of the Landguard Point. HARWICH Harbour, 1862.
Holyhead. Act for the purchase of lands, 1847. HOLYHEAD.
—— Anchorage of the proposed harbour of refuge. CHRISTIE (J. H.), 1847.
—— Chester and Holyhead Railway Company. Carriage of H.M. mails. HOLYHEAD, 1847.
—— Comparative merits of Holyhead and Port Dynllaen as a Harbour of Refuge for the Channel trade. HOLYHEAD, 1844, '46.
—— Construction of a Deep Water Pier and the removal of the Platters Rocks. HOLYHEAD, 1890.
—— Large blasts at Holyhead. ROBERTSON (G.), 1859.
—— Plan by Rendel, 1846. HOLYHEAD. Approval of Rendel's plans, 1847. HOLYHEAD.
—— Report on Holyhead and Dynllaen Harbours Communication with Ireland, 1844. HOLYHEAD.
—— Report of Commissioners. HOLYHEAD, 1847.
—— Report of Select Committee on Holyhead Harbour Bill. HOLYHEAD, 1847.
—— Report of Committee on Holyhead Road and Harbour, 1810. HOLYHEAD.
—— Reports of Engineer since 1863. HOLYHEAD.

HARBOURS—*continued.*

Holyhead. Final Report of J. Hawkshaw, 1873. HOLYHEAD.
—— Select Committee to inquire into. HOLYHEAD, 1864.
—— Survey, 1837. LIVERPOOL, p. 246.
—— Holyhead Refuge Harbour. WILLIAM (C. W.), 1847.
Howth Harbour. DUNLEARY, 1809.
—— Report. HOWTH, 1810.
Indian Harbours. Report to the Government of India. ROBERTSON (G.), 1871–73.
Ireland. Observations on Capt. Evans' report on the Harbours of Larne, Loch Ryan, Portpatrick, Donaghadee, and Belfast. RENNIE (Sir J.), 1846.
Isle of Man Harbours. Report. WALKER (James), 1856.
Italy. ITALY, p. 146.
—— (Leghorn, Genoa, Palermo), Rock Dredging Works. CIMINO and Verdinois, 1893.
Kakanui in the province of Otago. JOHNSTON (T. M. H.), 1875.
Karáchi Harbour, tides, port dues, pilotage, fees, etc., 1892. INDIA, p. 120.
—— Harbour Works, 1855, 1866–67, '68, '69, '72, '73, '79, 91. INDIA, p. 121
—— Works. PRICE (W. H.), 1879.
—— Improvements. WELLS (H.), 1858.
—— Reports. PARKES (W.), 1858, '64; WALKER (James), 1835. 1858, p. 396.
Kattegat, Northern. Yachting and commercial harbour in. LÜDERO, 1878.
Kidwelly, Carmarthenshire, Act for improvement of, 1812. KIDWELLY.
King's Lynn Port and Harbour. WHEELER (W. H.), 1882.
Report on the outfall of the River Ouse. KING'S LYNN, 1882.
Kowie Harbour. Reports on improvement. KOWIE Harbour, 1863, '68.
Kustendjie Harbour Company. Report. DANUBE and Black Sea, 1860.
Leith, present state. ANDERSON, J., 1836.
—— Plan of Leith Harbour and Docks. LEITH, 1884.
—— Plans and Reports for the improvement of. WALKER (James) and Cubitt, 1839.
—— Wet docks, proposed. ROBERTSON (G.), 1864.
Lisbon. Projected harbour works. BENSAUDE (J.), 1887.
Liverpool. Survey, 1837. LIVERPOOL, p. 246.
Liverpool and Birkenhead. HAVESTADT (C.), 1886.
Lynn. Proposals for amending the harbour of Lynn. ARMSTRONG (J.), 1724.
Lyttelton, New Zealand Harbour works. CANTERBURY, N.Z.

HARBOURS—*continued.*

Macquarie Harbour, Tasmania. Report on Entrance, 1890. MACQUARIE Harbour.

Madras, 1873, '85. INDIA, p. 123; MOLESWORTH, 1882.

—— Harbour and Ports of the Northern Circars, 1855. INDIA, p. 123.

—— Present state and prospects of the Works. PARKES (W.), 1879.

Malabar Coast, Harbours of refuge on, on the mud-banks of Narrakal and Allippey. ROBERTSON (G.), 1873.

Mandavee in Kutch. Albert Edward Breakwater. ORMISTON, 1876.

Mannheim Harbour establishment. MANNHEIM, 1886.

Margate. Report. RAMSGATE, 1850.

Maryport. Bill to amend Acts, 1833. MARYPORT.

—— Proposed Harbour of Refuge. PAGE (T.), 1865.

Massachusetts. Report of Board of Harbour Commissioners, 1868. MASSACHUSETTS.

Massachusetts. Reports of the Harbour and Lands Commissioners, etc. MASSACHUSETTS, 1881.

Mediterranean Sea. French Harbours. HAGEN (G.), 1858.

Melbourne, improvement of. COODE (Sir J.), 1879.

Mersey Docks and Harbour. BIRCKEL, 1865.

Mexico (Gulf of) Deep Harbour. Letter. MEXICO (Gulf of), 1889. Add. 520.

Milford, Province of Canterbury, formation of a proposed harbour. JOHNSTON (T. M. H.), 1877.

Montreal. Scheme of Improvements. BELL (R. B.), Newton and Fleming, 1877; CHILDE, 1857; MONTREAL, 1873–77; TRAUTWINE (J. C.), 1859.

—— Reports, 1863, 1875. MONTREAL.

Mossel Bay, Cape Colony. Harbour Improvements. MOSSEL Bay, 1876–80.

Mount's Bay. Prospectus of new Harbour. MOUNT'S Bay, 1810.

—— Report on the practicability of forming a harbour at the mouth of Loe Pool, Cornwall. RENDEL (J. M.), 1837.

Napier, New Zealand. Report. NAPIER, N.Z., 1875.

"Narrows" (The). Necessity and utility for harbours of refuge in. MARTIN (K. B.), 1839.

Natal (Port). COODE (Sir J.), 1877.

—— Harbour Board Surveys of the Bar at Port Natal, 1843–94. NATAL. Add. 522.

—— Reports. NATAL, 1888, etc.

—— Harbour works. Report. NATAL, 1889.

New York. Destruction of Flood Rock by explosion. ABBOT (H. L.), 1886.

HARBOURS—*continued.*

New York. Observations on the deposit of silt, 1854–57. HASWELL.

—— Delaware Breakwater. HAUPT (L. M.), 1886.

—— Haupt's system of Floating Deflectors. HAUPT (L. M.), 1886.

—— Plan for defending the Harbour, 1862. NEW YORK CITY.

—— Report on the Improvement of Harbours in the vicinity of New York City, etc., 1886, p. 356.

New Zealand beaches, Drift material of, and their effect on Harbour works and Rivers. BELL (C. N.), 1892.

Newcastle Harbour, New South Wales. Improvements, 1888. NEWCASTLE, N.S.W.

Newhaven. Modern history. BANISTER (F. D.), 1879.

—— Harbour and piers. NEWHAVEN.

—— Harbour of Refuge. ROBERTS (Capt. Julius), 1866.

—— Sketches for its improvement. FORTUNE, 1825.

—— Report. WALKER (James), 1846, p. 393.

Newport. SMYTH (W. S.), 1893.

Norway. NORWAY, 1877–'80.

Ontario (Lake). Annual Report upon the Improvement of Harbours on. KINGMAN (D. C.), 1893. Add. 514.

—— Spur Crib placed off Oswego outer Harbour, Lake Ontario, New York. JUDSON, 1889.

Ostia. RENNIE (Sir J.), 1845.

Pendeen, Cornwall, proposed Harbour and Breakwater. JOHNSTON (T. M. H.), 1854.

Perth. Extension. STEVENSON (R.) and Son, 1834.

Peterhead harbour works. Reports. PETERHEAD HARBOUR, 1888; STEVENSON (D.), 1847; STEVENSON (T.), 1883,

Plymouth Sound. Proposal for a Coal Depôt and Harbour. HARRIS (T.), 1857.

Port Alfred, Cape Colony. Harbour Works. PORT ALFRED, 1876.

Port Elizabeth, East London, and Port Alfred, S. Africa. PORT ELIZABETH, 1870.

Portcullin Cove Harbour, estimate of expense. PORTCULLIN COVE, 1814.

Portland. Harbour of Refuge. PORTLAND, 1847.

Portsmouth. Proposed Steam-packet harbour. RENDEL (J. M.), 1840, p. 100.

Pulteney-town, Wick, Caithness. BREMNER, 1844.

Quebec. PILKINGTON (W.), 1879–81.

—— Harbour Commissioners' Reports. QUEBEC, 1887.

Queensland. Mackay, Townsville. COODE (Sir J.), 1887.

—— Port Curtis. PORT CURTIS, 1875.

HARBOURS—*continued.*

Queensland. Report. QUEENSLAND, 1865, 1877, 1882–83, 1886, p. 71. Sailing Directions, 1894. QUEENSLAND, p. 71.

Ramgate Pier and Harbour. RAMSGATE, 1815.

—— Reports. RAMSGATE, 1850, 1853.

—— Acts for maintenance and improvement. RAMSGATE, 1792, 1797, 1815. Bye Laws for regulation. RAMSGATE, 1840.

—— Report. SMEATON (J.), 1791, p. 208.

Redcar. Asylum Harbour and Naval station. BROOKS (W. A.), 1832, 1834.

Rye Harbour Bill to amend several Acts, 1833. RYE Harbour.

—— Rother Levels Bill. Improvement and drainage of Rye Harbour. ROTHER (River), 1791.

—— Harbours of Rye and Dover. Report on Petitions, 1757. RYE Harbour.

—— General plan of the Bay and of the Old and New Rye Harbours. RYE Harbour, 1763. Add. 532.

Saint Helier, Jersey, Report on, and documents. SAINT HELIER, 1838.

—— Specifications for New Pier. ST. HELIER, 1841.

—— Victoria Harbour. Enlargement. BONNIN (R.), 1863.

St. John's, Newfoundland. Harbour Report. ROBINSON (G.), 1883.

St. Nazaire, Bremerhaven, Oakland and St. Petersburg Harbours. Dredging operations at. TIMONOFF (V. E.), 1892.

St. Peter-port, Guernsey. Proposed new harbour. JOHNSTON (T. M. H.), 1850.

San Francisco, California. Working of the Marine Worms and the remedies applied. BLACKBOURN, 1874.

—— Report on the removal of Blossom Rock in. WILLIAMSON (R. S.) and Heuer, 1871.

Sandwich. RENNIE (G.), 1837. Central Kentish Railway and Sandwich Harbour Company. Prospectus. CENTRAL Kentish Ry., 1836.

—— Cleansing of the Haven of Sandwich. RAMSGATE, 1792.

—— Proposed Harbour. SANDWICH, 1744.

—— Report to the Directors of the Sandwich Harbour Company. RENNIE (G. and J.), 1837.

Sarclet in the parish of Wick. Machinery employed in the rebuilding of the harbour. BREMNER, 1836.

Scarborough. CHAPMAN (W.), 1800–30, p. 243.

Scheveningen. CONRAD (F. W.), Storm Buijsing and Beijerinck, 1858. SCHEVENINGEN, 1858, '61, '66; SICCAMA (H. T. H.), 1874.

HARBOURS—*continued.*

Scilly Islands. Report on the obstacles, etc., attending the formation of a Roadstead within the Islands. SCILLY Islands, 1810.

Scotland, East Coast, the most suitable place for a harbour of refuge. Report. SCOTLAND, 1884, p. 174.

—— Scottish Harbours. SCOTLAND Roads and Bridges, 1806–21.

Seaham. Explanation of the plan of the Harbour. CHAPMAN (W.), 1830, 1831, p. 241. Projected extension. CHAPMAN (W.), 1832, p. 243.

Shoreham. CHAPMAN (W.), 1821, p. 243; CHAPMAN (W.), 1822, p. 241.

—— Shingle bar at the mouth. PRITCHARD, 1843.

—— New Shoreham. CHAPMAN (W.), 1815, p. 242; CHAPMAN (W.), 1823, p. 241.

—— Sailing directions for. CLEGRAM (W.), 1823.

—— Harbour near New Shoreham and making a new entrance into the dangerous port near Kingston-on-Sea. Comparative statements of the specific differences between. VAZIE (R.), 1816.

Sierra Leone. Improvements. PRICE (J. M.), 1871.

Sound harbour between Sweden and Denmark. HAVESTADT (C.), 1880.

Southwold. Proposal for its improvement. CALVER, 1856.

—— Expediency of improving the harbour by means of the River Blyth. CLISSOLD, 1840.

—— Report. ELLIS (F. W.), 1839.

—— Report on the state of the harbour, bar, and river. WALKER (James), 1841, p. 394.

Sunderland. PICKERNELL, 1798.

—— Engineer's Report. Lower Harbour Improvements. SUNDERLAND Harbour, 1858. Add. 535.

—— Pier, Plan for rebuilding it, etc. SMEATON (J.), 1780, p. 208

—— Progressive Improvement. MURRAY (John), 1849.

—— River Wear Act, 1819. WEAR (River), 1819.

—— Report. RENNIE (Sir J.), 1831.

Swansea. Acts 1804 and 1854. SWANSEA Harbour.

—— Report on the site for docks and works now in progress in. BRUNEL (I. K.), 1846. Add. 488.

—— Plan of the harbour. CAPPER (R.), 1879.

—— Report on improvement of the harbour. HUDDART, 1804.

Sydney Circular Quay, Report on Improvements to, 1888. SYDNEY, p. 272.

—— Report relating to the proposed Dredge and Plant. SYDNEY, 1890, p. 272.

Table Bay, Cape of Good Hope. Harbour of Refuge. COODE (Sir J.), 1859.

HARBOURS—*continued.*

Table Bay, Cape of Good Hope. Despatch from and Correspondence with the Secretary of State on the Construction. TABLE Bay, 1857, 1859.

—— Report for improving, 1879. TABLE Bay.

—— Works projected by Mr. Coode. Report. TABLE Bay, 1860.

—— Works. Statement of Expenditure incurred in their construction. TABLE Bay, 1864.

—— Table Bay, Mossel Bay, and Algoa Bay Harbour Boards. Revenue and Expenditure, etc. TABLE Bay, 1881.

—— Table Bay, Mossel Bay, Knysna, Plettenberg Bay, Port Elizabeth, Port Alfred, and East London. COODE (Sir J.), 1877.

Tasmania Circular Head (Stanley), Report on. TASMANIA, 1890.

Tees Bay and Hartlepool Harbour. RENDEL (Sir A. M.), 1883.

Timaru Harbour Works, New Zealand. JOHNSTON (T. M. H.), 1877.

—— Report on Improvements. WILSON (R.) and Bell, 1891.

Toronto. Memorandum with plans and documents relating to the past and present state of. TORONTO, 1881.

—— Report. EADS, 1882.

Townsville, Queensland Harbour improvements. Report. TOWNSVILLE, 1885.

Trieste, projected. TRIESTE, 1862. Report, 1863. PASETTI, 1863. Address to Harbour Commission. HARTLEY (Sir C. A.), 1863; RZIHA, 1874.

—— Customs warehouses, Trieste. BUZZI (L.), 1892.

—— Proposed canal to join Trieste and Muggia. BUZZI (L.), [1870].

—— New harbour, 1883. KÖSTLIN, 1884.

Trinity Bay, on the south shore of the Firth of Forth, formation of harbour and dock. GRAINGER and Miller, 1834.

Tyne as a Strategic and Refuge Harbour. PLUMMER (B.), jun., 1875. Add. 528.

Tynemouth. State of the harbour. DODD, 1796.

United States. Improvement of the harbours of Lake Michigan, St. Clair, Erie, Ontario, and Champlain. GRAHAM (J. D.), 1859.

—— Ogdensburg, on the St. Lawrence, on Lake Champlain, of Grass and Tricanderoga Rivers and of Otter Creek. OGDENSBURG, 1885.

—— Powers and Duties of the Board of Harbour and Land Commissioners. UNITED States, 1890, p. 349.

—— Reorganisation of National Public Works so far as they relate to the improvement of Harbours and Rivers. UNITED States, 1888, p. 349.

HARBOURS—*continued.*

United States. River and Harbour Bills of the U.S. Congress. HERSCHEL (C.), 1885.

—— System of Submarine Mines for defence of harbours. ABBOT (H. L.), 1881.

Valencia Harbour as a Western Packet Station. Reports. WALKER (James), 1858.

Vardö Harbour. Sections of Breakwaters. VARDÖ, 1894.

Venezuela. La Guaira Harbour Works. CAREY, 1893.

Verawal Harbour Works, 1869. INDIA, p. 133.

Victoria Harbour Improvements and a River and Harbour Trust. Reports, etc. VICTORIA, 1860, p. 375.

Whitby Harbour Improvement. Report. SANDEMAN (J. W.), 1880.

Whitehaven. Wet dock. COODE (Sir J.), 1866.

—— Dock accommodation. RENDEL (Sir A. M.), 1863.

—— Plans for improvement of. WHITEHAVEN, 1836.

Wick Harbour Improvement. Report. SANDEMAN (J. W.), 1881.

—— Correspondence. WICK Harbour, 1874.

Wynyard, Tasmania. Report on proposed new Harbour. WYNYARD, Tasmania, 1890.

Yarmouth Harbour and Roads as a Harbour of Refuge. WALKER (James), 1858, p. 395.

—— Port and Haven. Report on the Extension of the North Pier and Improvements of the Haven. TEASDEL (W.), 1867.

Yarmouth. Report on the practicability of making Brayden navigable for vessels drawing 10 feet of water. WALKER (James), 1826.

See also PORTS.

HARMONY of sound and form. COLE (P.), 1865.

HEALTH (PUBLIC). BUCK (A. H.), 1879; CHADWICK (Sir E.), 1868, 1877, 1878, p. 235; CHAPELLE, 1850; PARENT-DUCHATELET, 1836; PARKES (E. A.), 1876. Practical Hygiene. PARKES (E. A.), 1864, '83; PERIODICAL PUBLICATIONS, p. 22; RAWLINSON (Sir R.), 1870; WILDE (E.), 1885.

Acclimatisation and Tropical Hygiene. SCHELLONG (O.), 1894.

Acts, etc. Bill for improving the Health of Towns, 1847. Act for promoting Public Health, 1848, '49. PARLIAMENTARY..Papers, p. 497.

—— Public Health Act, 1848. Notes and Queries. GANT, 1855.

—— Act for promoting the Public Health. LAWES (E.), 1849.

—— Administration of the Public Health Act from 1848 to 1854. BURNELL; PARLIAMENTARY..Papers, p. 497.

—— New Public Health Bill. BURNELL, 1855.

—— Public Health Bill and Nuisances Bill, 1855. SMITH (Joshua Toulmin), 1855.

HEALTH (PUBLIC)—*continued.*

Acts, etc. Reasons against the Public Health Bill, 1855. PARLIAMENTARY..Papers, p. 497.

—— Reports of the Medical Officer of the Privy Council, 1858–70, 1873–78. PARLIAMENTARY..Papers, p. 498.

—— Act for consolidating and amending the Acts relating to Public Health in England, 1875. Report of Select Committee on, 1878. PARLIAMENTARY..Papers, p. 498.

—— Local Government Act, 1875. FITZGERALD (J. V. V.), 1886.

—— Bill to amend the Public Health Act in relation to Buildings in Streets, 1888. PARLIAMENTARY..Papers, p. 498.

—— Instructions for the use of Local Boards of Health, 1855. PARLIAMENTARY..Papers, p. 498.

—— Health (Public) Act, 1875. Suggestions as to preparation of district maps and plans. RAWLINSON (Sir R.), 1878.

—— Reports of Health of Towns Commission, 1844–45. PARLIAMENTARY..Papers, p. 497.

Appliances, Health and its. NICOLL, 1885.

Armies in the Field, Hygiene of. RAWLINSON (Sir R.), 1883.

Building in relation to Health. BUZZI, 1879.

Culture (Health). JAEGER (G.), 1887.

Dangers to Health. A guide to Domestic Sanitary Defects. TEALE (T. P.), 1883.

Demography, Public Health and, Handbook. WILLOUGHBY (E. F.), 1893.

Dictionary. BLYTH (A. W.), 1876; TARDIEU (A.), 1852–54.

Engineers, present and future work of, in reference to. DONALDSON (W.), 1878.

Handbook, Hygiene. WEYL (T.), 1893, etc.

History and development of the Public Health service in civilized States. FINKELNBURG (C.), 1893.

Hygiene of Dwellings. RIETSCHEL, 1894. Add. 530; BUZZI (L.), 1879.

International Congresses on Hygiene and Demography. Paris, 1878; Vienna, 1887; London, 1891. INTERNATIONAL Congress.

Laws relating to Public Health. BAKER (T.), 1865; CHAMBERS (G. F.), 1875; CORFIELD, 1880; SMITH (William R. and H.), 1883.

Manual, 1847. METROPOLITAN Working Class Assoc.

Nations, Health of. A review of the works of Edwin Chadwick. RICHARDSON (Sir B. W.), 1887.

Naval Hygiene. LE ROY DE MÉRICOURT, 1876; MACDONALD (J. D.), 1881.

Nuisances Removal, and Diseases Prevention Amendment Acts, and the Common Lodging-house Acts. ANONYMOUS, 1855. Add. 481.

HEALTH (PUBLIC)—*continued.*

Sanitary practice and law. Guide. WILLOUGHBY (E. F.), 1893.
Zeitschrift für Hygiene. PERIODICAL PUBLICATIONS, p. 26.

Baltimore. Health Department. BALTIMORE, 1884–87.
Belgium. Dangerous trades. BELGIUM, 1873, p. 117.
Berlin. BERLIN, 1886; BOERNER, 1882.
Brighton. Health Congress, 1881. BRIGHTON.
Brunswick. BLASIUS (R.), 1885.
Dukinfield and Denton Local Boards of Health Bill. DUKINFIELD, 1869.
London. Act to consolidate and amend the Laws, 1891. LONDON, p. 264, MACMORRAN.
—— Report of the Medical Officer of Health, 1849. LONDON, p. 264.
—— Metropolitan Sanitary Commission. Reports, 1847–48. LONDON, p. 264.
Massachusetts. Reports of the Board of Health, 1870, etc. Manual, 1886, '90. MASSACHUSETTS.
New York State. Report and Bulletin of State Board of Health, 1881, etc. NEW YORK STATE.
—— Local Boards of Health, 1890. NEW YORK STATE.
—— Act for the preservation of the Public Health, 1888. NEW YORK STATE.
Oswego, N. Y. Rules and Regulations of Board of Health, 1889. OSWEGO, N. Y.
Paris. Report. MARIÉ-DAVY, 1880.
Rio de Janeiro. GALVÃO, 1858.
United States. Annual Report of the National Board of Health. UNITED States, 1882–3. p. 355.
Winchester, Health of the Prisoners of War in the King's House at. WINCHESTER, Hants, 1803.
Wisconsin. State Board of Health. Tenth, etc., Annual Report, 1886–90. WISCONSIN, State of.

HEALTH (GENERAL BOARD OF).

Exercise of its extraordinary powers. HAWKSLEY, 1853.
Letter to Chairman. APPLEGARTH, 1853.
Minute on the proposed Surveys, 1850. PARLIAMENTARY..Papers, p. 497.
Money received and payments, 1851–52. PARLIAMENTARY..Papers, p. 497.
Reports. RAWLINSON (Sir R.).
Reports of Surveying office, 1849–52. PARLIAMENTARY..Papers, p. 497.

HEALTH OF TOWNS.

Health and Sewage of Towns Conferences, 1876, '79.
SOCIETY for the Encouragement of Arts, 1876.

Works, progress of. ANONYMOUS, 1856, p. 45.

HEAT. CHAMORRO, 1870; GARNETT (W.), 1887; PECLET, 1828, 1843, '78; STEWART (Balfour), 1863.

Absorption and Radiation of Heat by Gaseous and Liquid Matter. TYNDALL (J.), 1863, p. 335.

Analytical theory of Heat. FOURIER, 1878; LAMÉ, 1861.

Application of heated currents to manufacturing and other purposes. WHISHAW, 1848.

Calorescence. TYNDALL (J.), 1865, p. 335.

Caloric. PUGH (S.), 1826.

Coal, relation to. BINNIE (A. R.), 1888.

Cold, mechanical production of heat and. MONTGRAND, 1886.

Colour, Influence of, and mechanical condition on Radiant Heat. TYNDALL (J.), 1866, p. 335.

Conduction, relative powers of metals and alloys to conduct heat. CRACE-CALVERT and Johnson, 1858.

Conversion of Heat into useful work. ANDERSON (W.), 1885, 1887, 1889; BINNIE (A. R.), 1888.

Distribution of Heat over the surface of the Globe. DOVE, 1853.

Effects of Heat on the bending qualities of Iron Plates. BARNABY (J. F.), 1882.

Elements. GUTHRIE (F.), 1868.

Energy, Thermal storage of. HALPIN (D.), 1893.

Entropy Temperature, Diagram. MOLLIER, 1893.

Exchange of Heat between Metal and Steam. DWELSHAUVERS-DERY, 1888.

Expansion by Heat of Water and Mercury. MATTHIESSEN, 1865.

Expansion of Structures by Heat. KEILY, 1887.

Fuel, economy of, and management of Heat. BUCHANAN (R.), 1815.

Fumific Impeller. (Direct application of hot products of combustion to the bodies on which they are required to act without the intervention of Machinery). GORDON (Alex.), 1845.

Geometrical representation of the expansive action of heat. RANKINE (W. J. M.), 1854.

Handbook. LARDNER, 1877.

Iron and Heat. ARMOUR, 1874.

Latent heat of steam and Absolute Zero. DONALDSON (W.), 1894. Add. 497.

Mabler's Calorimeter. GOLAZ, 1892.

HEAT—*continued.*

Mathematical Theory. POISSON, 1835, 1837.
Measurement, Heat. URE (A.), 1839.
—— —— theory of, and its application to industry. SCHINZ (C.), 1858.
Mechanical action of Heat. RANKINE (W. J. M.), 1850.
Mechanical applications, 1884. INSTITUTION of Civ. Eng.
Mechanical equivalent of Heat. COWPER and Anderson, 1887; HANSSEN (C. J.), 1888; ROWLAND (H. A.), 1880.
—— Rumford's Determination. THURSTON (R. H.), 1874, p. 310.
Mechanical theory of. CLAUSIUS, 1867, 1876, 1879; DUPRÉ, 1869; HIRN (G. A.), 1862, '68, '75; MCCULLOCH, 1876; MURGUE, 1888; PICTET, 1876; RANKINE (W. J. M.), 1850; RÜHLMANN, 1876–85; WASSMUTH, 1882; WOLFF (A. R.), 1880.
Molecular Physics, Contributions to. TYNDALL (J.), 1864, p. 335.
Contributions of molecular Physics in the domain of Radiant Heat. TYNDALL (J.), 1872, p. 334.
Molecular Vortices, hypothesis of, applied to the Mechanical theory of heat. RANKINE (W. J. M,), 1850.
Motive Force, Heat as a. BOURNE (J.), 1878; DEVILLEZ, 1881–2; TYNDALL (J.), 1863, '67, '75, '80, '87, p. 334.
Nature of Heat. COLBURN, 1863; LESLIE (Sir John), 1804.
Power. Heat as a source of power. TROWBRIDGE (W. P.), 1874.
Production and utilization of Heat. SER (L.), 1888.
Radiant Heat, Free transmission of, by different solid and liquid bodies. MELLONI, 1833.
—— Immediate transmission. MELLONI, 1833.
—— and conducted heat. HOOD, 1837, '44, '55, 69, '79.
Radiation. TYNDALL (J.), 1865, p. 335.
Specific Heat of Atmospheric Air and Steam. RANKINE (W. J. M.), 1850.
Sum of heat utilised in smelting Cleveland Ironstone. BELL (Sir I. L.), 1875, p. 120.
Sun heat, Terrestrial radiation, etc. Cunningham Memoirs, vol. 3. ROYAL Irish Academy, 1880–88.
Total heat of Steam. ANTOINE (C.), 1892.
Theory of Heat, application to the Steam Engine. ANDERSON (W.), 1886; MADAMET, 1889.
Theory. KELLAND, 1837; MAXWELL, 1871; PRESTON (T.), 1894. RITTER (A.), 1879; WEBER (Wilhelm), 1892–94.
Thermal Conductivity and Thermo-Dynamics. FORBES (G.), 1879.
Thermodynamics of Steam-Engine and Heat-Engines. PEABODY (C. H.), 1889.
Thermodynamics, Technical. ZEUNER (G.), 1887–90.
Useful arts, Heat applied to the. BOX, 1860, 1880.

HEAT—*continued.*

Utilization of Heat and other natural forces. SIEMENS (Sir W.), 1878, p. 198.

Waste of heat in smelting Ores of Iron. BELL (Sir I. L.), 1894, p. 121. Some Wastes of Heat. METCALF, 1881.

Water, heat developed by, when agitated. RENNIE (G.), 1857.

Water. Heat in its relations to Water and Steam. WILLIAMS (C. W.), 1860, '61.

HEAT ENGINES. REDTENBACHER, 1857.

Action of Heat Engines, explained by the Molecular theory. HELE-SHAW, 1890.

Application of Heat to hot-air engines, compressed air engines, and steam-engines. COURTIN, 1878.

Caloric Engine. ERICSSON (J.), 1833.

Handbook. ANDERSON (W.), 1887, 1889.

Heat Engines other than Steam Engines. HUBERT, 1892.

Lectures on Heat Engines other than Steam. HARRIS (H. G.) 1889.

Motive power of Heat, and on Machines fitted to develop that power. CARNOT, 1878, 1890.

Theory and Construction of a Rational Heat Motor. DIESEL (R.), 1894. Add. 497.

HEMP.

Culture. CAMPBELL (F.), 1845; WISSETT (R.), 1808.

India, Cultivation. INDIA, p. 102.

HERALDRY. Display of Heraldry. NEWTON (W.), 1846.

HIGHWAYS.

Highway Acts, 1862–78. GLEN (A.), 1879.

Highway construction, treatise. BYRNE (A. T.), 1892.

Pratt's Law of Highways. KYNNERSLEY, 1853; PRATT (J. T.), 1837, 1881.

Surveyors of Highways, Powers and duties of. GLEN (A.), 1880.

See also ROADS AND STREETS.

HILLS AND VALLEYS. Measurements of the Altitude of, in Kent. BLAND, 1870.

HISTORY.

Brazil. Revolt of 1893. Message addressed to the National Congress on. PEIXOTO (F.). Add. 527.

—— Correspondence on the surrender of Insurgent Refugees on board Portuguese corvettes. BRAZIL, 1894. Add. 487.

Britain. Camp of Aulus Plautius. AIRY (Sir G. B.), 1866, p. 19.

—— Invasion of Aulus Plautius. AIRY (Sir G. B.), 1860, p. 19.

—— Invasion by Julius Cæsar. AIRY (Sir G. B.), 1863, p. 20.

—— Invasions by the Romans. AIRY (Sir G. B.), 1865, p. 16.

HISTORY—*continued.*

Britain. Landing of Julius Cæsar. AIRY (Sir G. B.), 1851, 1852, pp. 17, 18.

—— —— Replies to Astronomer Royal and Camden Professor. LEWIN (T.), 1862. Add. 515.

Chilian Revolution. MANBY (E.), 1891 ; MONTT, 1891.

Congo Treaty. TOMLINSON (Thomas), 1884.

Eastern question. PIM (B.), 1877.

—— Letters to the press on the Eastern Question. WAGHORN (T.), 1840.

England, History of. Answer to Mr. Freeman. PEARSON (C. H.), 1868.

England in Egypt. MILNER, 1894.

English. Chronological, historical and heraldic charts of the Royal House of England from King Egbert to the present time. TIMMIS (I. A.), 1890.

—— Examination of Christopher Layer and others on charge of Conspiracy, 1722. LAYER, 1803.

France. Monarchy, its rise and fall. TOOKE (W.), 1855.

Greek. Fasti Hellenici. CLINTON, 1824.

Hastings, Battle of. AIRY (Sir G. B), 1852, p. 17 ; 1865, p. 16.

Holland. Ancient condition and History. STRATINGH, 1847–52.

Indian Official Thesaurus, introductory to Annals of Indian Administration. TOWNSEND (M.), 1858.

India. Report on causes of war in the Carnatic. INDIA, 1806. Add. 509.

—— Taylor's Manual and the Edinburgh Review. JACOB (Sir G. L.), 1877.

—— Sind 710 to 1590. INDIA, 1855, p. 131 ; MAHOMED Masoom, 1855.

Italy. Ancient Peoples. MICALI, 1844.

Social Sciences as aids in teaching History. MOSES, 1892.

Turkish affairs. PIM (B.), 1878.

United States. American Civil War. HOPE (A. J. B. B.), 1862.

HOISTS AND LIFTS.

Construction of lifts for persons in America. GUTERMUTH, 1894.

Hydraulic Lifts. SEYRIG (T.), 1883 ; WHICHCORD (J.), 1865.

—— on boats. FRÉSON, 1888, 1889.

—— on Canals. CLARK (E.), Standfield and Clark.

See also CANALS.

Lifts and Pneumatic Railways at the Liverpool Exhibition, 1886. GONIN (L.).

Lifts and Elevators. SELFE (N.), 1891.

Passenger and Warehouse Lifts. CRACKNELL, 1882.

HOISTS AND LIFTS—*continued.*

Patent perpendicular lift at Tardebig, on the Worcester and Birmingham Canal — SMITH (E.), Notary Public, 1810.
Railway Lifts of Compressed Air. — GONIN (L.), 1880.
Relative merits of working Hoisting Machinery by Steam, Water, and Electricity. — GOODWIN (G. A.), 1893.

HOME RULE. Ireland. Repeal of the Union, 1844. — LOYAL Nat. Repeal Assoc.

HOOKS (IRON). Strength of. — HIGGINS (G.), 1889.

HOROLOGY. *See* CLOCKS and Watches.

HORSE-POWER.

Diagrams. — IVESON, 1875.
Nominal horse-power. — GRAY, 1872.
Ratio of indicated to effective. — FROUDE (W.), 1876.
Tables of performance of horses. — RANKINE (D.), 1828.

HORSE-SHOEING. "Goodenough" system of shoeing horses. — COTTAM, 1869.

HORTICULTURE. *See* AGRICULTURE.

HOSIERY AND LACE. — BEVAN (G. P.), Industries, vol. 6.

HOSPITALS.

Barrack Hospitals in time of War. — ADENAW and Kaven.
British Seamen in Foreign Parts, Correspondence, 1879. — PARLIAMENTARY .. Papers, p. 481.
Circular Hospital wards. — SNELL (H. S.), 1885.
Construction of Hospitals. — GALTON, 1869.
Healthy Hospitals. — GALTON, 1893.
Report on the mode of conveying Small-pox and Fever Patients to the Hospitals in public vehicles, 1852. — PARLIAMENTARY .. Papers, p. 497.
Addenbrooke, Cambridge. Act. — ADDENBROOKE (1767).
Chatham. Plan of Naval Hospital. — CHATHAM, 1858, 1879.
Glasgow, Royal Infirmary, Designs, Plans, etc. — ABERDEEN, 1887.
—— Hospital Accommodation for infectious diseases. — RUSSELL (James B.), 1883.
Hull, Royal Infirmary. — HULL, 1886.
India. European Hospital, Darjeeling. — CHRISTIE (W. B.), 1885.
—— Madras. Report on Civil Dispensaries, 1856. — INDIA, p. 122.
—— Hospitals for Indian stations. — INDIA, 1804. Add. 510.
Marylebone, St., Infirmary. — SNELL (H. S.), 1886.

See also BARRACKS.

HOT-HOUSES. Remarks on the Construction of. LOUDON, 1817.

HOUSE. Practical Hints on taking a. BOULNOIS, 1885.
Hints on Houses. LANG (A.), 1853.

HOUSE-BUILDING. Designs for Cottages and small Villas. GYFFORD, 1806.

HOUSE DRAINAGE. *See* DRAINAGE OF TOWNS. SANITATION.

HOUSE-PROPERTY. Handbook. TARBUCK (E. L.), 1875, 1880.

HOUSING OF THE WORKING CLASSES. MARTIN (W.), 1872.
Agricultural Labourers' Healthy Moral Homes THOMPSON (P.), 1863.
Back to Back Houses, Report on, 1888. PARLIAMENTARY .. Papers, p. 481.
Cheap and healthy Dwellings. CHADWICK (Sir E.), 1869, p. 235.
Countries, Workmen's dwellings in all. MULLER and Cacheux, 1879.
Dwellings for Agricultural Labourers. SOCIETY for the Improvement of the Labouring Classes, 1850.
Dwellings for the Labouring Classes. ALLEN (G. B.), 1867.
—— Their arrangement, etc. ROBERTS (H.), 1850 and 1867.
Dwellings for the poor. COLTHURST, 1863 ; FORD (A. H.), 1877.
—— Workmen's dwellings at the end of the 19th century. CACHEUX, 1891.
Dwellings. Essentials of the Healthy Dwelling and the extension of its benefits to the labouring population. ROBERTS (H.), 1862.
—— Home reform, or what the working classes may do to improve their dwellings. ROBERTS (H.), 1852.
Labourers' Prize Cottages. FITZGERALD (L. M.), 1883.
Model Houses built in connection with the Exhibition of 1851. ROBERTS (H.), 1851.
Rehousing of the Artisan and Labouring Classes in Sanitary Dwellings. DUNSCOMBE (C.), 1889.
Sanitary Improvement, illustrated by the Metropolitan Societies for improving the Dwellings of the industrial classes, the Common Lodging House Act, etc. SMITH (Southwood), 1854.
England and Wales. Reports of the Commissioners, 1885. PARLIAMENTARY..Papers, p. 52.
France. Model Lodging-Houses in. CLARK (Geo.), 1855.
Ireland. Reports on Labourers' Dwellings 1873. IRELAND, p. 141.
London. Artizans' and Labourers' Dwellings between Middlesex Street and Houndsditch. HAYWOOD (W.), 1885, p. 35.

HOUSING OF THE WORKING CLASSES—*continued.*

London. Application of the Artizans Dwellings Bill to the Courts and Alleys of Gray's Inn Lane. ISAACS, 1875.

—— Displacement of the Poor by Metropolitan Railways and by other public improvements. DENTON (Rev. W.).

—— Provision of accommodation for the Labouring Classes. LONDON, p. 254.

—— Rehousing of the Poorer Classes of Central London. CORBETT, 1886.

Paris Exhibition of 1889. Workmen's Dwellings at the. ROULLIET (A.), 1889.

HURRICANES. *See* METEOROLOGY (Storms).

HUSBANDRY. *See* AGRICULTURE.

HYDRANTS.

Hydrants and Water-pipes for the protection of a City against fire. FREEMAN, 1892.

Injector Hydrant for Fire Extinction. GREATHEAD (J. H.), 1883.

HYDRAULICS. ANONYMOUS, p. 47; BÉLANGER, 1854–55; BOILEAU (P.), 1878, 1881; BOX, 1867, 1870, 1879; COLLIGNON, (E.), 1869–70; DOWNING, 1855, '61, '75; EYTELWEIN, 1808; FERGUSON (J.), 1799; FRANZIUS, 1890; GUGLIELMINI, 1719; GRAEFF, 1873; HAGEN (G.), 1853, '63; LANGSDORF, 1794–6; LECREULX, 1809; LESBROS, 1850; LEUPOLD, 1724; LOVE (H. D.), 1887; MASONI, 1889; MEISSNER, 1878; MERRIMAN, 1889; MORIN, 1858; RENNIE (G.), 1835; SWITZER (S.), 1729; TURAZZA (D.), 1880; VAUTHIER (L. L.), 1889; VECCHIO, 1887; WEISBACH (J.), 1855; WRAY (H.), 1880.

Agricultural Hydraulics. BUFFON (N. de), 1852, 1861, 1867; VARENNE, 1857.

Analysis of a Hydraulic Step. CALIFORNIA Univ., 1887.

Description des travaux hydrauliques de L. A. de Cessart. CESSART, 1806–8.

Experiences of undermining. DURAND-CLAYE, 1873.

Graphic solution of hydraulic problems. SPIESS (O.), 1887.

Hydraulic Architecture. FUNK (F. E. T.), 1808–9; PRONY, 1790–96; WIEBEKING, 1811–17; WIEBEKING and Kröncke, 1798–1805; WOLTMANN, 1791–99.

Hydraulic Engineering. AUBUISSON de Voisins, 1840, 1852; BÉLIDOR, 1737–53; BURNELL, 1868; DWYER (J.), 1847, 1852.

Hydraulic experiments. LAGERHJELM, 1822.

Hydraulic Manual. JACKSON (L. d'A.), 1875, '83.

Hydraulic Mechanics. FLAMANT, 1891.

Hydraulic service. PASSY, 1876.

Hydraulic works. Foundations. BEAUDEMOULIN, 1829.

HYDRAULICS—*continued.*

Hydraulics as a branch of Engineering. RENNIE (G.), 1835.
Hydraulics of the Motion and Equilibrium of Fluids. JOBSON, 1828.
Hydraulics, Town and Country. LAFFINEUR, 1865.
Hydraulics and Pyrodynamics. DUBUAT, 1816.
Hydrotechnical data. HÜBBE (H.), 1844.
Liquid veins: vena contracta. BIDONE (G.), 1829.
Mathematical and Practical Hydraulics. NAZZANI, 1876–77.
Physical Hydraulics. MOLLET, 1810.
Resistance to bodies passing through water. BOURGOIS (J.), 1845.
River and Harbour Hydraulics. CORTHELL, 1884–86.
Rural Hydraulics. GRIER, 1877
Simple Hydraulic Formula. STONE (T. W.), 1881.
Tables. BEARDMORE (N.), 1850, 1852; BLACKBURNE, 1870; RYDE (E.), 1851.
Torrents, rivières, fleuves, vallées. ÉLIE de Beaumont, 1869.
Tracts on Hydraulics. TREDGOLD (T.), 1826, '36, '62.
Vocabulary of terms peculiar to French and Italian Hydraulic Works. BUFFON (N. de), 1869. Add. 489.

America, South. Hydraulics of the Rivers Paraná, Uruguay, and La Plata Estuary. RÉVY (J. J.), 1874.
Belgium. Hydraulic Works. BELGIUM, 1878, p. 116.
Cape Colony. Reports of the Hydraulic Engineer, 1877–87. CAPE COLONY, p. 221.
Egyptians (Ancient). HIRT, 1815.
England, etc. Hydraulic Works and Hydrology of England, Canada, Egypt, and India. JACKSON (L. d'A.), 1885.
Italy. ITALY, p. 146.
—— Venetian territory. FOSSOMBRONI, 1847.
—— Venice. JERVIS, 1884.
Low Countries. MAGANZINI, 1877.
Lowell Hydraulic Experiments. FRANCIS (J. B.), 1855, '68, '71, '83.
Roorkee Hydraulic Experiments. BELLASIS, 1886; CUNNINGHAM (A.), 1881; FLAMANT, 1882.

HYDRAULIC MACHINERY.

Hydraulic apparatus. LE CHATELIER (H.), 1893; LUIGGI, 1883.
Hydraulic Buffers, Application of. CLERK (H.), 1868.
Hydraulic Cranes. MAYER (P.), 1887.
Hydraulic Machinery in Engineering Workshops, Employment of. TWEDDELL (R. H.), 1885.
Hydraulic Machinery. ADAMS (H.), 1880; ANDERSON (W.), 1880; FABRE, 1873; Cantor Lectures on Hydraulic Machinery. PERRY (Prof. J.), 1882, p. 29.

HYDRAULIC MACHINERY—*continued.*

Hydraulic Machines, results as applied in Holland.
CUPPARI, 1883.

Hydraulic and other Machinery for raising Water.
EWBANK, 1842, '50, '54.

Motive power. Hydraulic Machinery for obtaining small.
ANDERSON (W.), 1871.

—— Water Motors. Treatise on hydraulic Motors.
ARMENGAUD (J. E.), 1844; WEISBACH (J.), 1877–83.

—— Relative Advantages of Wind, Water and Steam.
GOSLIN, 1879, 1881.

—— Hydromotor. FLEISCHER, 1879.

Press. CASALONGA, 1888. Improved injection entrances to Hydraulic Presses. CLARK, Standfield and Clark, 1882.

—— Friction of the Leather Collars. HICK, 1867.

—— High pressure and rubbing of leather. MARIÉ, 1881.

Pressure. Application of hydraulic pressure to the rollers of sugar-cane crushing mills. STEWART (D.), 1886.

Propeller, Patent Hydraulic, rudder and steering apparatus.
RUTHVEN (M. W.), 1866.

Ram applied to large Machinery. EYTELWEIN, 1822; PEARSALL (H. D.), 1886.

Water-pressure Engines. GLYNN, 1849; MAYER (P.), 1887.

—— For Mining purposes. DAVEY, 1880.

Genoa Port. Hydraulic Machines furnished to the Italian Government by T. Walker & Co. WALKER (A. T.), 1887.

HYDRAULIC POWER.

Best means of utilising Water Power. CUTLER (W. H.), 1879.

Calculation of Water and Mill Power.
BEARDMORE (N.), 1850, '52.

Hydraulic Machinery employed in the Concentration and Transmission of Power. MARKS (G. C.), 1891.

Hydraulic Power and Hydraulic Machinery.
ROBINSON (Prof. H.), 1887, 1893.

Power of Water applied to drive flour-mills, etc. GLYNN, 1853.

—— of various districts. PORTER (D.), 1880.

Testing Flume of the Holyoke Water Power Company.
HERSCHEL (C.), 1882.

Verein Deutscher Ingenieure. Reports. INTZE, 1889.

Workshops and Ironworks. ÅNGSTRÖM, 1886.

Huron and Erie Lakes. GREENLEAF, 1885.

India. Proposals for utilising Water Power in Southern India.
CHATTERTON (A.), 1892.

Leeds. Notes on the proposed Hydraulic Power Company.
WALKER (A. T.), 1886.

HYDRAULIC POWER—*continued.*

London. Public Hydraulic Power.
GENERAL Hydraulic Power Company, 1884. Add. 502.

—— Hydraulic power supplied in the City of London, Westminster, Southwark, and Kensington Court, 1886.
LONDON Hydraulic Power Co.

Maine water power, Report upon. WELLS (W.), 1868.

Mississippi. GREENLEAF, 1887.

Niagara River. GREENLEAF, 1885.

Sydney. Motive Power on the High Pressure Hydraulic System Act, 1888. SYDNEY, p. 272.

United States. North-West. GREENLEAF, 1887.

Winnipeg. Water Power of the Assiniboine River in Manitoba. FANNING, 1889.

HYDRODYNAMICS. BOSSUT, 1771, 1796; BERNOUILLI (D.), 1738; MOSELEY, 1830; RUSSELL (John S.), 1837; WEX (G. von), 1888.

Hydrodynamics of Blue Books and of the Metropolitan Drainage Reports. NEVILLE (J.), 1858.

New equation. Prof. Challis and Prof. Tardy. MOON, 1850.

HYDRO-GEOLOGY.

London. Water-bearing strata. PRESTWICH, 1851.

Middlesex, Herts, Essex and Surrey. LUCAS (J.), 1877–78.

Moscow, Hydrogeology of. PETUNNIKOFF, 1886.

HYDROGRAPHY.

Hydrographic Proceedings of H.M.S. Challenger. CHALLENGER, 1873–76.

Hydrographic and Mining Surveys. HEARDING, 1872.

Hydrographical Surveying: a description of the means employed in constructing marine charts. WHARTON (W. J. L.), 1882.

Nautical Surveying. BEAUTEMPS-BEAUPRÉ, 1823; BELCHER, 1835; JEFFERS (W. N.), 1878; LAUGHTON, 1882.

Ocean Currents. SMELLIE (T. D.), 1885.

African hydrography or the 16th century after the first Portuguese explorations. CORDEIRO (L.), 1878. Add. 494.

America. Anuario hidrografico del Rio de la Plata. AROCENA, 1891.

—— Province de Minas-Geraes. LIAIS, 1865.

Atlantic (North). Ocean and Davis Strait, Hydrographic Proceedings in. "VALOROUS" (H.M.S.), 1875.

Baden. BADEN, 1883.

Belgium. Hydrographic Service Report. BELGIUM, 1879. Add. 484.

Bohemia. HABLACHER, 1872–75.

Caspian Sea. CASPIAN Sea, 1877.

HYDROGRAPHY—*continued.*

Damietta and Om Fareg and Port Said. Remarks on the Surveys of the Coast between, made in H.M.S. "Fawn." WHARTON (W. J. L.), 1877.

France. Dictionnaire hydrographique. RAVINET, 1824.

Great Britain. Admiralty Hydrographic Surveyors, General Instruction for. ADMIRALTY, 1862. Add. 479.

—— Admiralty Interference with tidal and navigable waters, 1847. PARLIAMENTARY..Papers, p. 465.

—— Bristol Channel to English Channel. Account of a level Line measured from, during 1837–38. WHEWELL (W.), 1839.

—— Channel Pilot. KING (J. W.), 1856–59.

—— List of Oceanic depths and serial temperature observations, 1888–90. PARLIAMENTARY..Papers, p. 516.

—— Pilot's Handbook for the English Channel. KING (J. W.), 1876.

—— Hydrographical Map of the British Isles. PETERMANN, 1866.

—— Piloting Directions for St. George's Channel and the Coast of Ireland. NIMMO, 1832.

—— Report by the Hydrographer of the Admiralty on the examination and charting of the seaboard in various parts of the globe, 1880, &c. PARLIAMENTARY..Papers, p. 516.

—— Sailing directions for the Sound of Harris, Western or Outer Hebrides. OTTER and Stanton, 1859.

Holland. Observations hydrographiques et topographiques. KRAYENHOFF, 1835.

Italy. ITALY, p. 146.

—— Milan. SORMANI, 1881.

North Sea Pilot, 1857–58. NORTH Sea.

Piedmont. MICHELOTTI (J. T.), 1803.

Scotland. Little Minch, between the Outer Hebrides and Skye. OTTER, 1859.

Spain. SPAIN, 1866, 1886.

West India Pilot. BARNETT (E.), 1883.

HYDROMETRY. *See* WATER-METERS.

HYDROGEN. Hydrogen for lighting and warming, manufacture of. VIAL (E.), 1868.

HYDROLOGY.

Hydrological Conditions of the upper basin of the Mississippi. REID (R. C.), 1885.

Manual. BEARDMORE (N.), 1862.

Africa (South). BROWN (J. C.), 1875.

Cotteswolds and the district around Swindon, Hydrology of. TAUNTON (J. H.), 1887.

Jura Mountains. LAMAIRESSE, 1873.

HYDRO-MECHANICS. BESANT, 1877 ; EMERSON (J.), 1881 ; INSTITUTION of Civ. Eng., 1885 ; RÜHLMANN (M.), 1857, '80.

HYDROSTATICS. FERGUSON (J.), 1799 ; GALBRAITH and Haughton, 1855 ; GREENHILL (A. G.), 1894; JAMIESON (A.), 1837 ; LARDNER, 1831 ; MAGNUS, 1878 ; MARIOTTE (E.), 1718. App. 567 ; MOSELEY, 1830 ; PARKINSON (Rev. T.), 1789 ; PINKERTON (R. H.), 1888 ; SWITZER (S.), 1729 ; WEBSTER (Thomas), Q.C., 1838, '47, '56.

Demonstrated after the manner of the Elements of Geometry. WHEWELL (W.), 1843, '49.

Hydrostatic Cabins for Ships to prevent sea-sickness. ALLAN (A.), 1874.

Hydrostatic batteries for coast defence. ALLAN (A.), 1874.

Hydrostatic batteries to give a steady gun-deck at sea. ALLAN (A.), 1874.

Objections of H. More to Boyle's experiments. MORE (H.), 1762.

HYGIENE. *See* HEALTH.

HYGROMETRY. Hygrometric Methods. Report. SHAW (W. N.), 1888.

Hygrometer. DECHARME, 1875.

I.

ICE.

Anchor Ice as affecting Public Water Supply. COLE (J. A.), 1879.
Ice Industry of the United States. HALL (HENRY), 1888.
Ice Machines. LEZÉ, 1890.
Manufacture of Ice. *See* COLD and Refrigeration.
Observations on Pure Ice. ANDREWS (T.), 1886, 1890.
Remarkable deposition of Ice round the decaying stems of Vegetables during Frost. HERSCHEL (Sir J. F. W.), 1833.
Ice-breaker. Inland Navigation, Germany. HONSELL, 1880.

ILLUMINATION. Art of Illuminating. WYATT (M. D.), 1860.

IMMIGRATION. *See* EMIGRATION.

IMPERIAL INSTITUTE, Work of. ABEL, 1887.

IMPERIALISM AND FREE TRADE. MOLESWORTH, 1886.

IMPORTS AND EXPORTS. Venezuela and British Guiana. Differential Duties, etc. VENEZUELA, 1887.
See also EXPORTS.

INDEXES. *See* CATALOGUES.

INDIA-RUBBER. BEVAN (G. P.), Industries, vol. 9.
India-rubber as an insulator for telegraphic conductors. HOOPER, 1865.
Vulcanised India-rubber Joints for Water and Gas Socket-pipes. Report. WICKSTEED (T.), 1848.

INDICATORS.

Constants for correcting Indicator Springs that have been calibrated cold.
CARPENTER, Marks and Barraclough, 1894. Add. 491.
Gas-engine Indicator Diagram. AYRTON and Perry, 1884.
Indicator diagram practically considered. BURGH (N. P.), 1869.
Installed on the armoured corvette, "La Thétis." MADAMET, 1875.
Richards's Steam-engine Indicator. PORTER (C. T.), 1874, 1883.
Slide bars. HARTMANN (W.), 1889.
Steam-engine Indicator. Errors of measurement of Power by. JACOBUS (D. S.), 1894. Add. 512.

INDICATORS—*continued.*

Theory. SLABY, 1889.
Twenty years with the Indicator. PRAY, 1885.
Watt's Indicator. CORNUT, 1873; MAUPEOU, 1882.
See also STEAM ENGINES (General References).

INDIGO, Culture and Manufacture of, in India. EAST India Company, 1836.

INDUSTRIAL CLASSES AND INDUSTRIAL STATISTICS. BEVAN (G. P.), Industries, vols. 13 and 14.

INDUSTRIAL LIFE, Phenomena of. DAWES, 1874.

INDUSTRIAL PROPERTY. Congrès Suisse de la Propriété Industrielle. CONGRÈS, 1883.

INDUSTRY.

Industrial and Commercial Enterprises. LINCOL, 1869.
Industries and Iron. PERIODICAL PUBLICATIONS, p. 16.
Productive Industry. How to develop it in India and the East. COLA, 1867.
Protection to Home Industry. ANONYMOUS, 1879, p. 53.
Revista tecnologico industriale. PERIODICAL PUBLICATIONS, p. 23.
Revue industrielle. PERIODICAL PUBLICATIONS, p. 23.
Alaska, Report on the Industries of. PETROFF (I.), 1884.
British Industries, Revival of. ANONYMOUS, 1885, p. 54.
Cleveland and South Durham. CLEVELAND, 1885; IRON and Steel Inst.
France, Industrial Publications of. THIRION (C.), 1867.
Germany. TARUSSIO, 1880.
Ireland. KANE (Sir R.), 1845.
—— Development. STODDART, 1847.
Italian. ELLENA, 1880.
—— Mechanical and Naval Industry. ITALY, 1885. Add. 511.
Jubbulpore School of Industry. Report, 1856. INDIA, p. 120.
Mulhausen. History of an industrial centre. CACHEUX, 1876.
New South Wales, Catalogue of products of. PHILADELPHIA, 1876, p. 33.
New Zealand. BLAIR (W. N.), 1884, 1887.
Scotland. BREMNER, 1869.
Ulster. CLARK (G.), 1882.
See also ARTS AND MANUFACTURES; COMMERCE; TRADE.

INFANTICIDE, India. Measures adopted for the Suppression of Female Infanticide in the Province of Kattywar. INDIA, p. 121.

INFECTION. Floating matter in the Air in relation to Putrefaction and Infection. TYNDALL (J.), 1881, '83, p. 334.

INFECTIOUS DISEASES.

Cholera at Sandgate: the connection of the Drainage and Water Supply. Report. SANDGATE, 1855.

Scarlet Fever and Measles. Effectual and simple remedy. WITT (C.), 1862.

See also EPIDEMICS.

INFECTIOUS DISEASES (ANIMALS).

Bovine Tuberculosis, Investigations concerning. UNITED States, 1894. Add. 537.

Infectious Swine Diseases, Investigations concerning. UNITED States, 1894. Add. 537.

INFERNAL MACHINES. Infernal Machines in War. WAUWERMANS (H.), 1870.

INFLAMMABLE LIQUIDS. Bill to amend the law relating to keeping, selling, and conveyance, 1891. PARLIAMENTARY..Papers, p. 481.

INJECTORS.

Giffard's Injector. GIFFARD, 1861; OLRICK, 1865.

Steam Injectors, history and use. POCHET, 1877.

INLAND NAVIGATION. BÉTANCOURT, 1807; EGERTON, 1818–20; GOURY, 1827; GRAY (J.), 1768; PHILLIPS (J.), 1785–94, 1792–1803; STEVENSON (D.), 1850; SYMPHER, 1886; VALLANCEY (C.), 1763; ZELS, 1887. Map. PRIESTLEY (J.), 1830.

Canals and Inland Navigation. WHEELER (W. H.), 1889.

—— and Rivers. LAGRENÉ, 1869–73; GUILLEMAIN, 1885.

—— —— Canal and River Engineering. STEVENSON (D.), 1858, 1872–86.

Canalisation by means of self-acting weirs. CARRO, 1887.

Conference on Inland Navigation. Report. SOCIETY for Encouragement of Arts, etc., 1888.

Congresso Internazionale di Navigazione interna. Fourth Congress at Manchester, 1890. BOMPIANI and Luiggi.

Congrès international de navigation intérieure, Paris, 1892. COENE, 1893.

Convention on Waterways. Proceedings held at Sault Ste. Marie, Michigan, July 20th, 1887. WATERWAYS Convention, 1887.

Experimental researches on material. MAS, 1891–93.

History, 1766–69. ANONYMOUS, p. 47.

[illegible]

[illegible] STARY, [illegible]
[illegible] RAY, [illegible]
[illegible] [illegible], [illegible] TAUFFOF, [illegible]
[illegible] *See also* Steam Engines (general references).

[illegible] Cultivation and Manufacture of, in India.
East India Company, 1836.

INDUSTRIAL CLASSES AND INDUSTRIAL STATISTICS.
[illegible] Industries, vols. 3 and 4.

INDUSTRIAL LIFE, Elements of. DAWES, 1874.

INDUSTRIAL PROPERTY. Congrès Suisse de la Propriété industrielle. CONGRESS, 1883.

INDUSTRY.
Industrial and Commercial Enterprises. LINCOLN, 1869.
Industries and Trade. PERIODICAL PUBLICATIONS, p. 16.
Productive Industry. How to develop it in India and the East. COLA, 1867.
Protection to Home Industry. ANONYMOUS, 1879, p. 53.
Rivista tecnologico industriale. PERIODICAL PUBLICATIONS, p. 23.
Rivista industriale. PERIODICAL PUBLICATIONS, p. 23.
Alaska. Report on the Industries of. PETROFF (I.), 1884.
British Industries, Revival of. ANONYMOUS, 1885, p. 54.
Cleveland and South Durham. CLEVELAND, 1885; Iron and Steel Inst.
France. Industrial Publications of. THIRION (C.), 1867.
Germany. TARUSSIO, 1880.
Ireland. KANE (Sir R.), 1845.
Development. STODDART, 1847.
Italian. ELLENA, 1880.
Mechanical and Naval Industry. ITALY, 1885. Add. 511.
Jubbulpore School of Industry. Report, 1856. INDIA, p. 120.
Melbourne. History of an industrial centre. CACHEUX, 1876.
New South Wales, Catalogue of products of. PHILADELPHIA, 1876, p. 33.
New Zealand. BLAIR (W. N.), 1884, 1887.
Scotland. BREMNER, 1869.
Ulster. CLARK (G.), 1882.
See also ARTS AND MANUFACTURES; COMMERCE; TRADE.

INFANTICIDE, India. Measures adopted for the Suppression of Female Infanticide in the Province of Kattywar. INDIA, p. 121.

INFECTION. Floating matter in the Air in relation to Putrefaction and Infection. Tyndall (J.), 1881, '82, p. 331

INFECTIOUS DISEASES.
Cholera at Sandgate: the connection of the Drainage and Water Supply. Report. Sanitation, 1869
Scarlet Fever and Measles. Effectual and simple remedy Wise (C.), 1869.

See also Epidemics.

INFECTIOUS DISEASES (Animals).
Bovine Tuberculosis, Investigations concerning United States, 1894 Add. 837.
Infectious Swine Diseases, Investigations concerning United States, 1894. Add. 837.

INFERNAL MACHINES. Infernal Machines in War. Wauwhumann (H.), 1870.

INFLAMMABLE LIQUIDS. Bill to amend the law relating to keeping, selling, and conveyance, 1881. Parliamentary, Papers, p. 481.

INJECTORS.
Giffard's Injector. Giffard, 1861; Glover, 1869
Steam Injectors, history and use. Pocock, 1877.

INLAND NAVIGATION. Brancourt, 1807; Bourne, 1818 40; Govey, 1827; Gray (J.), 1768; Phillips (J.), 1750 94, 1792 1803; Stevenson (R.), 1849; Symons, 1888; Vallancey (C.), 1763; Ware, 1887. Map Pinkerton (J.), 1800
Canals and Inland Navigation. Williams (W. H.), 1849
— and Rivers. Latimer, 1869 78; Grothmann, 1869.
— — Canal and River Engineering Stevenson (R.), 1813, 1874 88
Canalisation by means of self acting weirs. Canal, 1887.
Conference on Inland Navigation. Report Society for Encouragement of Arts, &c., 1883
Congresso Internazionale di Navigazione Interna Fourth Congress at Manchester, 1890. Bompiani and Inaigi
Congrès international de navigation intérieure, Paris, 1894 Cuvier, 1894
Convention on Waterways Proceedings held at Sault Ste. Marie, Michigan, July 20th, 1887 Waterways Convention, 1887
Experimental researches on material Mar, 1861 64
History, 1766 69. Anonymous, p. 47

INLAND NAVIGATION—*continued.*

Improvement of Waterways. Benefits to be derived from. VERNON-HARCOURT (L. F.), 1893.

International Congresses: Brussels, 1885; Vienna, 1886; Frankfort, 1888; Manchester, 1890; Paris, 1892. BOEHMCHES, 1890; INTERNATIONAL Congress on I. N.

Improvement and Extension of Inland Communication and Transport. GRAHAME (T.), 1835.

Keeping canals open for navigation during winter through the agency of artificial heat. THURSTON (R. H.), 1873, p. 309.

Organisation. MARCHETTI (C.), 1886; SCHROMM, 1886.

Normal profiles of Canals. SCHLICHTING, 1886.

Political Economy of Inland Navigation, etc. TATHAM (W.), 1799.

Prime Cost of Transport by waterways—France, Germany and Austria. NÖRDLING, 1885.

Regimen of Ports. MONET, 1892.

Stoppages on canals and canalised rivers. COENE, 1892.

Tolls and fees collected on Navigable Ways. COUVREUR, 1892.

—— Dues. BEAURIN-Gressier.

Traction, different means of. RIGONI (G.), 1887.

Universal Inland Navigations and the use of all sorts of Mines. LEACH (E.), 1791.

Value of Inland Waterways. PEEZ, 1886.

Waterways (Inland), Transportation. JOHNSON (E. R.), 1893.

American Artificial Waterways between the Lakes and Hudson River. SWEET (E.), 1885.

Arun (River), Act for the improvement of the navigation of. ARUN (River), 1785.

Austria and Germany. Navigable ways. SAINT HUBERT, 1881.

Belgium. GRANGEZ, 1855.

—— Navigation of, towards Paris. VIFQUAIN (J. B.), 1838.

—— Navigable Ways in 1893, Movements of Transports on. BELGIUM, 1894. Add. 484.

—— Network of navigable waterways. BELGIUM, 1881, p. 116.

—— Belgium to Paris. BELGIUM, 1840, p. 116.

—— Voies navigables. BELGIUM, 1879, 1880, 1889, p. 116.

Bristol, Liverpool, and Hull. Inland navigation easily effected between. WHITWORTH (R.), 1766.

Canada. Improvements of Inland Navigation. CANADA, 1871, p. 216.

Canadian Water Ways, from the Great Lakes to the Atlantic. KEEFER (T. C.), 1893. Add. 513.

Chelmer and Blackwater Navigation Act. CHELMER, 1793.

Chicago International Congress on Water Transportation. Reports, etc. CHICAGO, 1893. Add. 491.

INLAND NAVIGATION—*continued.*

Coleraine, Belfast, and Limerick, system which connects. COLERAINE, 1882.

Durham to the River Wear and branches. DODD, 1796.

Elbe and Oder Basins (Ports in the) Building and Working. DOEMMING, 1892.

England. CORDIER, 1819–20.

England and Wales, History of the Canal and River Navigation of. WELLS (L. B.), 1894. Add. 538.

—— Map of the Canals and Navigable Rivers of. WELLS (L. B.), 1894.

Europe. Navigable Ways. HARTLEY (Sir C. A.), 1885.

Europe, particularly England. ODDY, 1810.

Europe (Central), Water communication of. LANFRANCONI, 1880, '81.

Europe (Northern). Waterways. WEBER (M. M. von), 1881.

Forfar and Aberbrothwick. Inland navigation between, by means of Strathmore Canal. STEVENSON (R.), 1817.

France. BECQUEY, 1820; CORDIER, 1819–20; DUMONT (A.), 1861; DUTENS, 1829; FABRE, 1797; FRANCE, p. 439; GRANGEZ, 1855; MOLINOS, 1875. Laws. POTERLET, 1820.

—— Canals and Rivers which traverse the departments of the Meurthe, the Vosges, Meuse and Moselle. LACREULX, 1796.

—— Commercial Regimen of Ports in. DELAUNAY-Belleville, 1892.

—— Départément du Nord. CORDIER, 1820–28.

—— Map of routes. DELAISTRE, 1812.

—— Rivers and Canals. REYNAULD (L.), 1883.

—— Stoppages on Canals and Canalised rivers in the Northern and Eastern regions of France. DERÔME, 1892.

—— Territories of the French Empire. DUPAIN-TRIEL, 1811.

—— Traction of Boats in France. LASMOLLES, 1892.

France and England. HUERNE de Pommeuse, 1822.

France, Belgium, and Provinces on the left bank of the Rhine. COLLIN, 1865.

German Waterways. REUTSCH, 1885. Map, 1885. GERMANY.

—— Navigable Ways, Tolls and Dues on. SYMPHER (J.), 1892.

—— Waterways of Prussia and adjacent States. PRUSSIA, 1877.

Great Britain. GRAHAME, 1834.

—— Legislation. GRAHAME, 1836.

Hohensaaten to Spandau, Traction of Boats from. THIEM (A.), 1892.

Hungary. Respective use of Waterways and Railroads. HALÁSZ, 1892.

INLAND NAVIGATION—*continued.*

Hungary. Utilisation of Water and Rail Routes in, and their competitive influence in reducing freight charges. HALÁSZ (A.), 1893. Add. 505.

—— Utilisation of the Watercourses. TÜRR, 1881, '85.

India. Waterways or Railways. TYRRELL (F.), 1874.

Ireland. Acts 1815, 1816. IRELAND, p. 141.

—— Drainage and improvement of navigation and water power, Ireland, Act, and amended Acts 1842–47. IRELAND. Add. 511.

—— Increase of Agriculture, Manufactures and Commerce by its extension.

—— Inland Navigation. WILLIAMS (C. W.), 1831, '33.

—— —— Papers, State, etc., 1800, 1806, 1812, etc. IRELAND, p. 141.

—— —— Reports, 1813. IRELAND, p. 141.

Italy. Navigation between Venice, Padua, Verona and the Adige. WIEBEKING (C. F. von), 1810.

Knaresborough. CHAPMAN (W.), 1802, p. 243.

Limerick Navigation. CHAPMAN (W.), 1795, p. 241.

Liverpool and Manchester. Means of competing with railways. GRAHAME, 1833.

London and Birmingham. Report on Improving the Water Communication between. MARTEN (H. J.), 1886.

Lough Neagh to Belfast. Plan and Estimates of the intended Navigation from. WHITWORTH (R.), 1770.

Lynn, Complaints of the Merchants, Mariners and Watermen of. KING'S LYNN, 1724.

Lynn and Yarmouth, Mediterranean passage between. MATHEW, 1656.

Lynn, Wisbeach, Spalding and Boston, Navigation of the Towns of. KINDERLEY, 1751.

Michigan (Lake). Proposed Waterway from Lake Michigan to the Mississippi River, *viâ* the Illinois and Mississippi Canal. BRYSON (A.), 1893. Add. 489. HENDERSON (T. J.), 1893. Add. 507.

—— Proposed enlargement of. COOLEY (L. E.), 1893. Add. 494.

Milan. BRUSCHETTI, 1821.

Neckar Basin, relations between the Waterway and the Railroad in the. HARTTUNG, 1892.

Netherlands. Dues and Tolls on Navigable Ways. DEKING-Dura, 1892.

New South Wales. Reports. NEW SOUTH WALES, 1859–60, p. 401.

Newcastle and Maryport, proposed line between. JESSOP and Chapman, 1795.

Newcastle and Carlisle, Navigation between. DODD, 1795.

INLAND NAVIGATION—*continued.*

Newcastle-upon-Tyne to the Irish Channel. CHAPMAN (W.), 1795, p. 242.

Newcastle to Haydon Bridge. Proposed navigation between the east and west seas. CHAPMAN (W.), 1795, p. 243.

Norway. SÆTREN (G.), 1892.

Norwich Navigation Improvement Committee on the Norwich and Yarmouth Navigation. CURTIS (J. G. C.), 1846.

Norwich to Yarmouth. Plan for making the river navigable. BROWN (C.), 1818.

Rhine Basin. Waterways and Railroads; their co-operation and their reciprocal competition in the. LANDGRAF, 1892.

Russian Waterways enlarged to meet the demands of Commerce. HOERSCHELMANN (E. F. de), 1893, '94. Add. 508.

—— Waterways, Taxes and Tolls on. SYTENKO (N. de), 1892.

Salisbury and Bristol, passage by Water between the two Avons of. MATHEW, 1656.

Sheffield. CHAPMAN, 1813, p. 243.

Stella to Hexham, and Hexham to Haydon Bridge, on south side of the Tyne. Report on proposed line of navigation. WHITWORTH (R.), 1797.

Stockton to Winston and branches. DODD, 1796.

Thames and Canal Navigation. Report to the Committee. WHITWORTH (R.), 1780.

United Kingdom, Taxes and Tolls upon the Inland Navigations of the. CLEMENTS, 1892.

United States. CORDIER, 1819–20.

—— Internal Navigation, natural and artificial: present and prospective. UNITED States, 1826, p. 341.

—— The Levels of the Lakes, as affected by the proposed Lakes and Gulf Waterway, &c. WISNER (G. Y.) and others, 1889.

—— Relations between railroads and waterways. NORTH (E. P.), 1892.

—— Waterways and Railways: their respective positions in transportation in the U. S. A. ROBERTS (T. P.), 1892.

—— Wisconsin and Fox Rivers. Report on the Transportation, route along, between the Mississippi and Lake Michigan. WISCONSIN (State of), 1876.

See also CANALS, RIVERS.

INSCRIPTIONS. City Latin on the new Bridge at Blackfriars. BIRCH (B.), 1760.

INSTITUTIONS. Bureau des Longitudes, situation of. FAYE, 1872.

See also SOCIETIES; UNIVERSITIES, etc.

INSTRUMENTS.

Description and use of a complete set of Pocket Instruments. WEBSTER (W.), 1739. App. 580.

Instruments and machines of J. Besson. BESSON (J.), 1582, 1602.

Instruments of precision. BALBRECK.

Notice on Instruments invented by Richard frères. RICHARD frères, 1886.

Theory of certain indicating and recording Apparatus. HELE-SHAW, 1888.

Treatise on new Philosophical Instruments. BREWSTER, 1813.

Anemometers. *See* ANEMOMETER.

Arithmetical Instruments, description and use of two. MORLAND, 1673.

Arithmometer. KERNOT, 1885.

Astronomical and Physical Instruments. MAGELLAN, 1780.

Astronomical Instruments. Method of dividing. BIRD (J.), 1767. App. 548; LUDLAM (W.), 1786. App. 566.

Azimuthal Circle. AIRY, 1851, p. 19.

Bathometer. SIEMENS (Sir W.), 1879, p. 198.

Blundell's Agricultural Drainage Level. BLUNDELL, 1848.

Calorimeter. MONTCHOISY, 1882.

Camera Obscura (Chevalier's), Advice on. CHEVALIER (V.), aîné, 1824. App. 551.

Celestial Compass. GRAYDON, 1825.

Chronograph, adapted for measuring the varying velocity of a body in motion through the air. BASHFORTH (F.), 1866; BASHFORTH (F.). Add. 484.

Chronographic Apparatus, with Huyghens' parabolic pendulum. ELLERY, 1885.

Chronoscope (Schultz). BENET, 1866.

Clinometer (Prismatic). POLE, 1853.

Collimator. AIRY, 1851, p. 19.

—— (Floating). KATER, 1825.

—— A new arrangement of a vertical collimator to the altitude and azimuth instrument. SIMMS (W.), 1846.

Cosmosphere: an instrument substituting an orrery, globe, &c. MULLER (W.), 1829. App. 570.

Curve-delineator and extensometer. FRÄNKEL (W.), 1883, 1884.

Cyclograph. PRICE-WILLIAMS, 1849.

Cyclometer. Discovery of an universal principle for dividing the Circumference of a Circle into a given number of equal parts. ADAMSON (W.), 1815. App. 543.

INSTRUMENTS—*continued.*

Delineator, Moment, (Alexander-Thomson).
ALEXANDER (T.) and Thomson, 1890.

Dipleidoscope, principles and construction. BLOXAM (J. M.), 1846.

—— or double reflecting meridian and altitude instrument.
DENT, 1843; DENT, 1843, '44. App. 554.

—— Use in the correction of time-keepers. DENT, 1843.

Dynamometer, New. FROUDE (W.), 1857.

—— Indicator and Dynamometer, with their applications to the Steam-engine. MAIN and Brown, 1864.

—— Mercurial Statical Dynamometer. MILNE (John), 1830.

Electrometer, Capillary. BURCH, 1890, 1892.

Eudiometers. MACLEOD, 1879.

—— New Eudiometer. CAVENDISH, 1783.

Geometrical Instruments. HUNÆUS, 1864.

Globes, Armillary Sphere, and Orrery. Description and use of.
MARTIN (B.), 1736. App. 567.

Gonoclinometer. BONDIS (A.), 1875.

Graphor: a new Mathematical Instrument. Longitude discovered by it. DEGRAVORS (P.) and Ould, 1794. App. 553.

Hydrometer. Engineers' Manual. SWIFT (L.), 1861. Add. 535.

Hygroscope, description of an improved.
ARDERON (W.), 1746. App. 545.

Induction Inclinometer, and its adjustments. LLOYD (H.), 1842.

Levelling Instrument (new form of). CUSHING, 1879.

Levelling Instruments (Portable). STEVENSON (D.), 1844.

Mathematical Instruments, construction and principal uses of. ADAMS (G.), 1803; BION (N.), 1758; BION (N.), 1752, '58. App. 548. HEATHER, 1851, 1877, 1888; MEREDITH, 1791; METIUS, 1632.

—— Engine for dividing.
RAMSDEN (J.), 1777, '79, '90. App. 572.

—— Engine for driving straight lines on. RAMSDEN, 1779.

—— With description and use of gunner's callipers.
ROBERTSON (John), 1775. App. 574.

Mathematical Instruments employed in surveying, levelling and astronomy. SIMMS (F. W.), 1836, p. 201.

—— Use of portable ones. SLEEMAN (T.), 1805.

—— Cantor Lectures. WILLIAMS (W. M.), 1879.

Measuring Machine (Whitworth). GOODEVE and Shelley, 1877.

Mechanical Paradox, description and use of a new machine called.
FERGUSON (J.), 1764. App. 556.

Micrometer (divided eye-glass double image).
AIRY (Sir G. B.), 1845, p. 18.

Micrometer and Megameter, account of a new.
BOSCOVICH (R. G.), 1777. App. 549.

INSTRUMENTS—*continued.*

Micrometer. Telescopical Mother of Pearl Micrometer.
CAVALLO, 1793.

—— Micrometer for measuring small angles with the Telescope.
CAVALLO (T.), 1791. App. 551.

—— Prismatic Micrometer, New Instrument for measuring small angles. MASKELYNE (Rev. N.), 1777. App. 568.

—— Description of two new Micrometers.
RAMSDEN (J.), 1779. App. 572.

Microphone. DU MONCEL, 1878, 1882; SCHWARTZE (T.), 1883, 1885, p. 172.

Microscopes. *See* MICROSCOPES.

Nautical instruments. Hydrostatoscope. Periheliotrope.
REITZ (F. H.), 1882, '83.

Navigation Instruments at the Paris Exhibition of 1855.
SMYTH (C. P.), 1855.

Omnimeter (Eckhold's). ECKHOLD, 1868.

Optical Instruments (New). Cantor Lectures. LOCKYER, 1884.

—— Catalogue of Optical, Mathematical, and Philosophical Instruments. JONES (Wm. and S.), 1817.

Orreries. How to construct. FERGUSON (J.), 1778. App. 557.

Orthochronograph. Description of, an instrument for ascertaining correct time by equal altitudes of the sun.
WEBSTER (R.) and Son, 1844. App. 580.

Phonograph. DU MONCEL, 1879, 1882.

Photometer. Dispersion Photometer.
PERRY (Prof. J.) and Ayrton, 1880.

Photophone. History of Selenium and its action in the Bell Photophone. JAMIESON (Andrew), 1881.

Pirameter, or instrument for ascertaining the power required to draw carriages over roads. MACNEILL, 1835.

Planetarium, or astronomical machine invented by Hahn and Mylius. Description. HAHN (P. M.), 1791. App. 559.

Planimeters. *See* INTEGRATORS.

Proportion Compass, or, land surveyors called to order.
ROSSI (G.), 1802. App. 574.

Proportioner (Concentric Circular), description of.
LAMB (J.), 1827; LAMB (J.), 1827. App. 565.

Pyrometer. ADIE, 1835.

—— With table of experiments made with it.
SMEATON (J.), 1754. App. 576.

Quadrants. *See* QUADRANTS.

Radiophone. DU MONCEL, 1882; SCHWARTZE (T.), 1883, 1885, p. 172.

Rain Gauge, self-registering. OSLER, 1840.

INSTRUMENTS—*continued.*

Range Indicator (Campbell's). CAMPBELL (J. R.), 1874.

Sextant (Hadley's), description and methods of adjusting the improved. RAMSDEN (J.), 1775. App. 572.

Sectograph. Description of T. Jones's patent. ENGLEFIELD (Sir H. E.), 1811. App. 556.

Sector. Description of. ANONYMOUS, 1697, p. 55.

—— for giving the proportionate sizes of Wheels and Pinions. PENNINGTON (R.), 1780. App. 571.

—— and Plain Scale Compared. REA (R.), 1727. App. 573.

Slide Rule. HENDERSON (W.), 1879.

—— Combined circular Slide Rule and scale tables of natural and logarithmic sines, rumb points, etc. DIXON (T.), 1886.

—— Engineer's and Mechanic's Slide Rule. COULSON, 1842.

—— Practical manual. PICKWORTH (C. N), 1894. Add. 528.

Sliding Rule (Roget's) of Involution, description of. GILBERT (W. and T.), 1828. App. 559.

Sun, Astronomical Rotula for showing the Rising and Setting of the.

Surveying and Levelling Instruments described. STANLEY (W. F.), 1890.

Tacheometry. *See* SURVEYING and Levelling.

Telemeter Company System. TELEMETER Co., 1886.

Telescopes. *See* TELESCOPES.

Temperature, Instruments for ascertaining the mean. STEVENSON (T.), 1870.

Thermosiphon. Applications to horticultural and other processes. FOWLER (T.), 1829.

Topograph (Lendy's Patent). LENDY (A. F.), 1864.

Uranographia, description and use of the new. GRANT (C.), 1800. App. 559.

Greenwich Observatory. Principal Instruments there in the time of Halley. RIGAUD (S. P.), 1836. App. 574.

Paris. Société d'Encouragement. Instruments presented to, by H. Robert. Report. HERICART de Thury, 1833. App. 562.

See also ASTRONOMY (Instruments).

INSURANCE.

Accidents. Mutual Assurance Offices. GIGOT, 1892.

Engine and Boiler Insurance Company. Reports, 1880, etc. ENGINE.

—— Steam Boiler Assurance Company, Engineer's Reports. STEAM Boiler, etc., 1873–81.

INSURANCE (FIRE).
Boston Manufacturers' Mutual Fire Insurance Company. BOSTON Manufacturers, 1883, 1890.
Flour Mill (modern) Insurance. SIMON (H.), 1890.
Globe Insurance Company. Act to grant charter, 1800. STONESTREET (G. G.)
Law of Fire and Life. BEAUMONT (G. B. D.), 1846.
Norwich Union Fire Insurance Society. Act 1879. NORWICH Union.
Phœnix Fire Office. Dangers of Electric Lighting. HEAPHY, 1882.

INSURANCE (LIFE). RANKIN (R.), 1830.
Account of population, law of mortality, and different systems of Life Insurance. BURT (A.), 1849.
Doctrine of Life Annuities and Assurances. BAILY, 1813.
Probability of human life in Glasgow and other large towns. CLELAND, 1836.
Regulations respecting Government Life Insurance and Annuities, 1865. PARLIAMENTARY..Papers, p. 481.
Tables of Premiums, 1865. PARLIAMENTARY..Papers, p. 481.
Various Institutions. BABBAGE (C.) 1826.
See also ANNUITIES.

INSURANCE (MARINE).
Lloyd's. Act to amend Lloyd's Act, 1871. LLOYD'S.
—— Register. 1848–49, etc. Annals, 1884. LLOYD'S Register.
Marine Insurance (Lloyd's). AUKLAND, 1893.
Underwriters' registry for Iron Vessels. List of Iron Vessels, 1870–81. UNDERWRITERS' registry for Iron Vessels.

INSURANCE (NATIONAL).
Necessary and possible. EDE (W. M.), 1889.
Patriotic Assurance Company of Ireland. Act to define and extend its objects. PATRIOTIC Assurance, 1890.
What is it? BLACKLEY, 1890.

INTEGRATORS (MECHANICAL). ABBOTT (W.), 1886.
Amsler's Planimeters. HIRN, 1875.
Hohmann-Coradi's Precision Planimeters. CORADI, 1855; REITZ (F. H.), 1878, 1882, 1884.

INTOXICATING LIQUORS. Cape Colony Report of the Liquor Laws Commission. CAPE Colony, 1890, p. 221.

INUNDATIONS.
Causes. DEUTSCH (J.), 1877.
Means of prevention. DEGLAUDE, 1872; POIRÉE, 1858.
Ardèche, Rivers of the. MARDIGNY, 1860.

INUNDATIONS—*continued.*

France. LOMBARDINI, 1858. From the sixth century to the present time. CHAMPION, 1858–64.
Hungary. Prevention from. LANFRANCONI, 1882.
Mauritius, 1865. Report. MAURITIUS.
Valencia, 1864. BOIX (V.), 1865.

INVENTIONS.

Adumbration of Inventions. HARDINGHAM, 1893.
Birmingham Inventors and Inventions. PROSSER, 1881.
Century of Inventions. WORCESTER (Marquis of), 1825; WORCESTER (Marquis of), 1825. App. 581; DIRCKS, 1865.
Chats on Invention. MARTIN (J.), 1894. Add. 518.
Cultivation of the Inventive Faculty. THWAITE (B. H.), 1894, p. 311.
Designs and descriptions of machines relating to arts, manufactures, and domestic life. WHITE (James), 1822.
History. BECKMANN, 1846; PLAT, 1653; WHITE (F. S.), 1827.
Improvements in the useful arts. Counsel to the Inventors of. TURNER (T.), 1850.
Mechanic: or compendium of practical inventions. SMITH (James), 1816–18. App. 577.
Philosophical, Mechanical, Chemical and Agricultural discoveries. ANONYMOUS (1806–11), p. 54.
Property in Designs and Inventions in Arts and Manufactures. WEBSTER (Thomas), Q.C., 1853.
Remarks on the right of property in mechanical invention with reference to Registered Designs. TURNER (Thomas), 1847.
Repertory of Patent Inventions. PERIODICAL PUBLICATIONS, p. 23.
Western Review of Science and Invention. PERIODICAL PUBLICATIONS, p. 26.

See also PATENTS FOR INVENTIONS.

IRON.

Application of Iron for defensive purposes, 1861–64. PARLIAMENTARY..Papers, p. 482.
Art of working iron. LANDRIN (L.), 1829.
Behaviour in great cold. KÖPCKE and Hartig, 1892.
British and Foreign railway rates on Iron. BRITISH Iron Trade, 1885.
Carbon, modifications of, in iron. LEDEBUR, 1893.
Carbon and Silicon in Iron. Condition. SNELUS (G. J.), 1870.
Carburets (Iron), Electrical and Magnetic Properties of. BARUS and Strouhal, 1885.
—— Physical properties of. BARUS and Strouhal, 1886.

IRON—*continued.*

Changes in the internal structure of iron independent of and subsequent to manufacture. HOOD, 1842.

Chemical analysis of Iron. BLAIR (A. A.), 1888.

Chemistry of Iron. Notes. TROILIUS (M.), 1886.

Coke, preparation of, for the manufacture of cast iron. CRACE-CALVERT, 1852.

Constructions in, execution of. BRANDT, 1865; CORNU, 1887; DUPUY DE LÔME, 1843. Pattern Book. SCHRABOWSKY, 1887–88.

—— Material of Construction, 1872. POLE, 1872.

—— Notes on Iron constructions. ROMAND (A.), 1842.

Corrosion. IRVINE, 1891.

—— Experiments upon the Action of Sea and River Water upon cast and wrought iron. MALLET (R.), 1839, '43.

—— Preservation of Iron in sea water. BECQUEREL (A. C.), 1864.

—— Railway bar corrosion. MALLET (R.), 1850.

Electric resistance of iron and its alloys to high temperatures. LE CHATELIER (H.), 1890.

Experiments on the strength of rolled and forged iron. LAGERHJELM, 1827.

Fabrication of Iron for defensive purposes. BARNARD (J. G.), etc., 1871–2.

Founder (Iron), art of moulding. BOLLAND, 1893.

Furnaces, forges, and rolling mills of the United States. LESLEY, 1866.

Girders. *See* GIRDERS.

History, properties and processes. FAIRBAIRN, 1861, 1869, p. 402.

Homogeneous Iron, production of, in large masses. PENDRED (V.), 1870.

Improvements in the manufacture of iron. LARKIN (J.), 1869.

Interest of Great Britain in supplying herself with iron. ANONYMOUS, p. 47.

Invention of grooved rollers for the manufacture of bar iron. MUSHET (D.), 1855.

Iron: Journal of Science, etc. PERIODICAL PUBLICATIONS, p. 17.

Iron and its derivatives rendered inoxidisable by the electric current. MERITENS, 1886.

Iron in all Lands. PECHAR (J.), 1878.

Iron Economics. SKELTON (H. J.), 1891.

Iron merchants' guide and assistant. BURLINSON and Simpson, 1865.

Iron-Minium, Manufactory of, situate in Anderghem, near Brussels. CARTIER, 1860.

"Iron question" vindicated. ANONYMOUS, 1857, p. 47.

IRON—*continued.*

Iron and heat. ARMOUR, 1874.
Iron century. SCHWEIGER-LERCHENFELD, 1884.
Ironwork. BAUDE, 1829.
Ironwork and retaining-walls. SMITH (Chas. G.), 1875.
—— Practical designs of Structural Ironwork. ADAMS (H.), 1894. Add. 479.
—— Employment of Ironwork in building construction. BURN (R. S.), 1874.
—— Handbook. APPLEBY BROTHERS, 1869, 1877.
—— Iron, work in. HANDYSIDE (A.) and Co., 1868. Add. 505.
Magnetic and other physical properties of Iron at a high temperature. HOPKINSON (J.), 1889.
Magnetization of. HOPKINSON (J.), 1885.
—— Electro-chemical effects on. ANDREWS (T.), 1887–91.
—— Different Magnetic Properties of hot-rolled and cold-rolled Malleable Iron. AIRY (Sir G. B.), 1862, p. 19.
Malleable. MARTENS, 1887. Practice and theory. WEDDING, 1875.
—— Manufacture of, with special reference to the Richardson process. DAY (St. J. V.), 1868.
Manufacture of Iron. ANSIAUX and Masion, 1865; COUAILHAC, 1860; OVERMAN, 1854.
—— Use of Anthracite. JOHNSON (W. R.), 1841.
—— Crane's patent for the combined use of hot air, blast, and anthracite. ROWLAND (D.), 1842.
—— Method of improving the Art in Tuscany. CINI, 1849.
Means of extending the use of Iron. BELGIUM, 1880, p. 116.
Melting of. KIRK (E.), 1878.
Metallum Martis. DUDLEY (D.).
Metallurgy of. BAUERMAN, 1868, 1874, 1882, 1890; BECKERT, 1885; DAY (St. J. V.), 1868; JORDAN (S.), 1881; JULLIEN (C. E.), 1861; KARSTEN, 1830; LEDEBUR, 1884; PERCY (J.), 1864; SAINT-ANGE (W. de), 1835–8.
Molecular Changes produced in Iron by variations of Temperature. THURSTON (R. H.), 1873, p. 310.
Morewood and Rogers' Patent Galvanised Tinned Iron. MOREWOOD, 1846.
Oxidation of Iron. CRACE-CALVERT, 1872.
Puddling. BAYLIS, 1866; SIEMENS (Sir W.), 1868, p. 198.
—— by machinery. Various plans as a means to effect. YATES (W.), 1868.
—— Mechanical Puddling. NURSEY, 1874.
—— Properties of Puddled Iron, ingot iron and steel for constructive purposes. ADAMSON (D.), 1875.
—— Treatise on Iron up to the manufacture of puddled bars. ROGERS (S. B.), 1858.

IRON—*continued.*

Railway Iron. Monthly report of exports. RICHARDSON (W. W.), 1882–3.

Rolled, real value of, for free trade. CORT (H.), 1860.

Roll-turning for the manufacture of Iron. TUNNER (P.), 1869.

Rolling of Iron. Practical Treatise. NEVEU and Henry, 1881.

Salisbury Iron: its composition, qualities, and uses. THURSTON (R. H.), 1878, p. 311.

Sections of English Rolled Iron joists. MOSER and Sons, 1885.

Separation of Iron from other metals. HERSCHEL (Sir J. F. W.), 1821.

Separation of Oxide of iron. HERSCHEL, 1832, p. 51.

Spectrums of. Gases and Vapours evolved on heating iron and other metals. PARRY (J.), 1885.

Suggestions to Iron-masters on increasing the demand for iron. MACKELCAN, 1843.

Tables showing the weight of different lengths of round, square, flat, bar and cast, Iron. PENN (S.) and Ryberg, 1886.

Tabulated weights of angle, tee, bulb, beam, round, square, and flat iron. JORDAN (C. H.), 1870, '85.

Treatment of roasted pyrites by the Longmaid and Claudet processes for the extraction of gold and silver. EGLESTON, 1885.

Use of Iron by the Ancients. DAY (St. J. V.), 1871, '73; RITCHIE (R.), 1852.

Uses in the Naval Service, 1867. PARLIAMENTARY..Papers, p. 482.

Austrian Empire. Manufacture of Iron in the. BELL (Sir I. L.), 1865, p. 119.

Canada. Production and manufacture in Canada. BARTLETT (J. H.), 1885.

Dudley, Ironwork manufactured by the Oak Farm Iron Company, near. BOYDELL (J.), jun., 1843.

Germany. Pig Iron made in. SCHLINTE (J.), 1880.

Great Britain, manufacture of Iron in. BELL (Sir I. L.), 1867, p. 120.

—— Iron manufactures in Great Britain. THURSTON (R. H.), 1871, p. 309; TRURAN (W.), 1862.

India. Manufacture by private enterprise. MOLESWORTH, 1882.

Liége. Manufacture. FRANQUOY, 1861.

Russia. Manufacture of Russian Sheet Iron. PERCY (J.), 1871.

Sweden, Manufacture in (English and German). ÅKERMAN, 1873.

Swedish Iron experiments. DELLWIK, 1878.

United States, Manufacture of the, compared with that of Great Britain. BELL (Sir I. L.), 1877, p. 120.

—— Iron Manufacture in all ages and particularly in U.S.A. for 300 years from 1585–1885. SWANK (J. M.), 1884.

IRON ORES.

Iron and Iron Ores. HUNT (T. S.), 1870.
Iron ores and process of manufacture. FORDYCE, 1860.
—— roasting. ÅKERMAN, 1879, '80; BIRKINBINE, 1883.

Catamarca. KYLE, 1873.
Cornwall, Spathic Iron Ores of. ROEBUCK (W. R.), 1874.
Cerro de Mercado (Iron Mountain) at Durango, Mexico. BIRKINBINE, 1883.
Cumberland, Hæmatite ores of. FAIRBAIRN (Sir W.), 1844, p. 401.
Diélette, near Cherbourg, Magnetic Iron Ore at. RICHARDSON (Joshua), 1866.
Great Britain. GEOLOGICAL Survey, 1856–61.
Himalayas. INDIA, p. 121.
Kumaon, 1855. INDIA, p. 122.
Madras Presidency, 1855. INDIA, p. 123.
Missouri. Report, 1872. MISSOURI.
Næverhaugen, Norway, Iron Ore Deposits at. NORDENFELT, 1876.
Northampton Iron Ore district. BUTLIN, 1880.
Nova Scotia Report, 1856. NOVA SCOTIA.
—— Coals and Iron Ores of Picton county. HARTLEY (E.), 1870.
Penokee, U. S., iron-bearing series of Michigan and Wisconsin. IRVING (R. D.), and Van Hise, 1892. Add. 511.
Samakoff, Turkey properties. FAIRBAIRN (Sir W.), 1844, p. 401.
Scandinavia. HEAD (J.), 1894.
Spain, the Asturias. FORSTER, Cooper and Jamieson, 1843.
United States. Iron ores of the "great vein" region. RILEY (J. B.), 1873.

IRON PLATES.

Calculated weights of Iron plates. BURLINSON and Simpson, 1865.
—— Properties of Essen and Yorkshire wrought-iron plates. KIRKALDY (D.), 1875.
—— Resistance of Iron Plates to impact. GRACEY, 1863; GRACEY, 1863. Add. 503.
Sheet Iron and Boiler Plate Roller. PERKINS and Stowe, 1867.

IRON SMELTING. *See* BLAST Furnaces.

IRON TRADE. HUPFELD, 1875.
Colliery Guardian and Journal of the Coal and Iron Trade. PERIODICAL PUBLICATIONS, p. 13.
Dispute in Iron Trade. FREEMAN, 1864.
History. SCRIVENOR (H.), 1841, 1854.

IRON TRADE—*continued.*

Industries (guns, nails, locks, hinges, etc.) BEVAN (G. P.), Industries, vol. 3.
Our Foreign Competitors in the. BELL (Sir I. L.), 1868, p. 120.
Potts' Mining Register and Directory for the Ironstone Trades. PERIODICAL PUBLICATIONS, p. 21.

Birmingham, Alabama. Iron Industry. KENT, 1892.
Cleveland. BELL (Sir I. L.), 1878, p. 119 ; GJERS, 1875.
Cumberland (West). Archæology. FLETCHER, 1880.
Fort Payne Coal and Iron Company. FORT PAYNE, 1888.
Germany, Iron Industry of. WEDDING (H.), 1880.
Great Britain, Manufacture of Iron in. WILKIE (G.), 1857.
Madras Presidency. Handbook. INDIA, p. 102.
Maryland Coal and Iron Company. Extracts from a report made to it. SILLIMAN (B.) and Sons, 1839.
Ohio (Southern). HUNT (T. S.), 1881.
Punjab, 1859, '83. INDIA, p. 129.
Scotland, Iron Trade of. ROWAN (F. J.), 1885.
United Kingdom, production. FOSSICK, 1886 ; MEADE, 1879.
—— British Iron Trade Association. BRITISH Iron Trade, 1877–90.
—— Iron industry in England. SIEMENS (Sir W.), 1878, p. 198.
—— Great Britain. GRIFFITHS (S.), 1873.
United States, history, 1621 to 1857. FRENCH (B. F.)
—— Resources. PUMPELLY, 1880.
—— Iron working industry. TRASENSTER (P.), 1885.

IRON (CAST).

Application of Cast and Wrought Iron to building purposes. FAIRBAIRN (Sir W.), 1854, p. 402.
Application of Hot-Blast in the Manufacture of. CLARK (Dr. T.), 1835.
Constituents. TURNER (Tho.), 1886.
Dimensions of Cast Iron at various temperatures. MILLAR (W. J.), 1881–82.
Experiments at Milton Iron-Works. Cast and Malleable Iron. MUSHET, 1843.
Experiments on its strength. YORK (J. O.), 1832.
Increased strength produced by the use of improved coke. CRACE-CALVERT, 1855.
Manufacture. FLACHAT, Barrault and Petiet, 1842–46 ; GUENYVEAU, 1835.
Mixtures of Cast iron and nickel, properties. FAIRBAIRN (Sir W.), 1858, p. 402.
Pig Iron. LEDEBUR, 1879.

IRON (CAST)—*continued.*

Pig Iron. Preliminary treatment of the materials used in the manufacture of Pig Iron in the Cleveland district. BELL (Sir I. L.), 1871, p. 120.

Properties of Cast Iron and other Metals. MILLAR (W. J.), 1886.

Treatment. HEATON, 1869.

IRON (WROUGHT).

Art of tempering Wrought Iron. REAUMUR, 1722. App. 573.

United States. Report of the Committees on Malleable Iron, re-heating and re-rolling Wrought Iron (strength of wrought iron in bars and chains). UNITED States, 1878, p. 351.

IRON AND STEEL. BEVAN (G. P.), Industries, vol. 1; GREENWOOD (W. H.), 1884, '91; WÖHLER (A.), 1870.

American Iron and Steel Association. AMERICAN Iron and Steel Association.

Antiquity. DAY (St. J. V.), 1874. Prehistoric use. DAY, 1877.

Brand Book of British Iron and Steel. GRIFFITHS (H. W.), 1883.

Burning. LEDEBUR, 1883.

Constructions. CONSIDÈRE, 1885–6.

Conversion of Forged Iron into Steel. REAUMUR, 1722. App. 573.

Converting Iron into Steel. Softening Cast Iron. REAUMUR (R. A. F. de), 1722. App. 573.

Corrosion. DAVIS (T. H.), 1886.

Different processes of manufacture. COUAILHAC, 1860.

Economic and social relations of production. PARIS, p. 456.

Elasticity, extensibility, and tensile strength. STYFFE (K.), 1869.

Engineering as applicable to Iron and Steel. NATHAN, 1883.

Essay on American Sand Iron, and Iron Ore, with methods of reducing into Pig or Sow Iron, and then into Bar Iron. HORNE (H.), 1773. App. 562.

Essays. HORNE, 1773.

Estimation of Manganese in, by the Colour Method. HUNT (A. E.), 1886.

—— Manganese, Carbon and Phosphorus in Iron and Steel. HUNT (A. E.) and Clapp, 1885. Add. 509.

Forge, Foundry, Factory and Office. HOARE, 1876.

Formation of bars. PETZHOLDT (A.), 1874.

Galvanic action between wrought iron, cast metals and various steels during long exposure in Sea Water. ANDREWS (T.), 1875.

Hydrogen and Nitrogen in. MÜLLER (F. C. G.), 1881.

Industries in foreign countries. FORBES (D.), 1873; IRON and Steel Inst., 1878.

IRON AND STEEL—*continued.*

Influence of temperature on the mechanical properties.
LE CHATELIER (A.), 1889.

Information and tables relating to the use of Wrought Iron and Steel. CARNEGIE, PHIPPS and Co.

Letters Patent for Improvements in the manufacture.
BESSEMER, 1857, 1886.

Letters Patent for Improvements in shaping, pressing and rolling malleable. BESSEMER, 1856.

Manufacture. KOHN, 1873. Cantor Lectures.
WILLIAMS (W. M.), 1876.

Manufacture of Steel and Ingot Iron from Phosphoric Pig Iron.
THOMAS (S. G.) and Gilchrist, 1882.

—— Iron Ore Producers at Cresson, 1882.
IRON and Steel Inst.

Mechanical, etc., properties of, in connection with their Chemical Composition. VOSMAER (A.), 1891.

Metallurgy, with special reference to American materials and processes. OSBORN, 1869.

National Convention of Iron and Steel Manufacturers and Iron Ore Producers. Proceedings, 1882.
NATIONAL Convention.

New method of casting. DORMOY, 1871.

Papers on. MUSHET (D.), 1848.

Passive state of Iron and Steel. ANDREWS (T.), 1890–91.

Principles of the Manufacture of. BELL (Sir I. L.), 1884, p. 120.

Puddling Iron and Steel, guide for. URBIN (E.), 1868.

Relative corrosion of. PHILLIPS (D.), 1890.

Relative electro-chemical positions of wrought iron, steels, cast metal, etc., in Sea Water and other solutions.
ANDREWS (T.), 1887.

Resistance and other properties. LOVE (G. H.), 1859.

Specifications of Improvements in the Manufacture.
MUSHET (R.), 1857.

Steam and water-power used in the manufacture.
HOLLERITH, 1888.

Strength and determination of dimensions and stability. Iron and Steel Constructions. WEYRAUCH (J. J.), 1877, '88.

Tensile Strength of American and English Iron and Steel.
THURSTON (R. H.), 1872.

Theoretical and Practical Treatise on the manufacture.
VALERIUS (B. and H.), 1875.

Trade. BELL (Sir I. L.), 1886, p. 119.

Transformation of Iron into Steel, by cementation.
BOUSSINGAULT, 1875.

IRON AND STEEL—*continued.*

Treatment of manufactured Iron and Steel for constructional purposes. How (W. F.), 1893. Add. 508.

Weight exported. Fossick, 1886.

Welding Cast Steel. Case of Mr. Heath, Inventor and introducer of the Manufacture of Welding Cast Steel from British Iron. Webster (Thomas), Q.C., 1806.

Whitworth. Improvements in Casting Iron and Steel. Minutes of evidence taken in the matter of the prolongation of Whitworth's patent, 1879. Whitworth (Sir J.).

—— Whitworth's Patent for Fluid-compressed Steel. Hearing of Sir J. Whitworth's Petition for a Prolongation. Whitworth (Sir J.), 1879.

Madras Presidency, 1855. Manufacture. India, p. 123.

United States, Industries of the. Colquhoun (W.), 1892.

—— Iron and Steel Production Statistics. Swank (J. M.), 1883.

—— United States Board appointed to test Iron and Steel and other metals. Report. United States, 1878–81, p. 351.

IRONWORKS. Dürre, 1882; Jonstorff, 1885; Kerpely, 1866–87; Styffe, 1868. Management of Iron Foundries. Dürre, 1892.

Creusot Works. Schneider (H.) and Co.

France. Comité des Forges de France. Comité, 1865, etc.

Grosmont. New Works. Coulthard, 1863.

India. Kumaon Government Ironworks, 1859. India, p. 121.

Languin. Survey and Estimate of the proposed Ironworks. Manby (E. O. and J.), 1841.

Park Gate Iron and Steel Works. Description. Rotherham, 1890.

Sweden. Ahrenberg, 1864. Ironworks, Mines, etc., province of Orebro. Blackwell (J. H.), 1864.

United States. American Iron and Steel Assoc., 1878–88; Bell (Sir I. L.), 1875, p. 119.

—— Saugus Ironworks at Lynn, Mass., etc. Woodbury (C. J. H.), 1892.

Wendel's Ironworks, Quality of products. Tetmajer, 1875.

IRRIGATION. Buffon (N. de), 1843; Cossigny, 1874; Culcheth, 1886; Donald (J.), 1861. Add. 497. Mullins, 1890; Ronna (A.), 1888–9; Villeroy (F.) and Muller, 1860.

Artificial Reservoirs for Rain Water, for the Irrigation of Land deficient in running water. Carena (G.), 1869. Add. 490.

Embanking, draining, and tilling land in tropical and other countries. Gibbs (Joseph), 1862.

Engineering (Irrigation). Wilson (H. M.), 1890, '93.

IRRIGATION—*continued.*

Irrigation Canals and other Irrigation Works. FLYNN, 1892.
—— Irrigation Works. THOMASON Civil Engineering Coll., 1862–4.
—— Practical Irrigator and Drainer. STEPHENS (George), Land Drainer, 1834.
—— National Irrigation; or, the various methods of watering meadows, etc. TATHAM (W.), 1801.
—— Notes on Continental Irrigation. ROTH (H. L.), 1882.
Management of Waters. COTARD, 1888.
Peat Bogs. Their Irrigation. SMITH (William), Engineer, 1806.
Political Economy of Irrigation. TATHAM (W.), 1799.
Productiveness. FORCHHEIMER, 1886.
Societies for Irrigation. RABBENO, 1878.
Vocabulary of terms peculiar to French and Italian Irrigation Works. BUFFON (N. de), 1869. Add. 489.
Water. Application of drainage water as a motive power to machinery for agricultural purposes. WILLIAMS (E. L.), senr., 1849.
—— Irrigation and water supply. SCOTT (J.), 1883.
—— Quantity of water consumed. CULCHETH, 1882.
—— Use of water in Agriculture. PARETO, 1851.
—— Water supply for Irrigation. NEWELL, 1894.
Wind Power, use of, for Irrigation. BROWNLOW (H. A.), 1877.
America (Central), Irrigation in. VICTORIA, 1885, p. 379.
Australia. Australian Irrigation Colonies Monthly Newspaper. PERIODICAL PUBLICATIONS, p. 12.
—— Australian Irrigation Colonies on the River Murray, in Victoria and South Australia. VINCENT (J. E. M.), 1888.
—— American and Australian. GORDON (G.), 1885.
—— India, lessons for Australia. CULCHETH, 1891.
—— Australia Irrigation works. CULCHETH, 1891.
—— Victoria. DEAKIN, 1886.
—— Victoria, Reports on the supply of water to the Northern Plains Irrigation. VICTORIA, 1882–4, p. 376.
—— Victoria Irrigation Reports. VICTORIA, 1886, p. 376.
—— Western Australia. DEAKIN, 1885.
Burma, British. Irrawaddy Circle Works. GORDON (R.), 1883.
Caucasus Irrigation Canals. GHERCEVANOFF, 1890.
Cowal Lake. Irrigation pumping plant. DONKIN (J. B.).
Egypt. BAROIS, 1887; BUCKLEY (R. B.), 1893; WILLCOCKS (W.), 1889.
—— Administration of the Irrigation Department, 1892, etc. GARSTIN.
—— Reports of the Administration for 1886–92. EGYPT, p. 384; ROSS (Lt.-Col. J. C.), 1890–92; SCOTT-MONCRIEFF (Sir C. C.), 1868.

IRRIGATION—*continued.*

Egypt. The Fayum and Lake Mœris. BROWN (R. H.), 1892.
—— Perennial Irrigation and Flood Protection. EGYPT, 1894; WILLCOCKS (W.), 1894.
—— Lower Egypt. EGYPT, 1856.
—— Notes on the Distribution of Water and maintenance of works in the basin system of Upper Egypt. ROSS (Lt.-Col. J. C.), 1892.
France, Italy, and Spain, Development in. CALIFORNIA, 1886.
—— Irrigation works of France, Spain, Italy. Report of a tour of inspection. SCOTT-MONCRIEFF (Sir C. C.), 1868.
—— French and Italian Irrigation Laws. VINCENT (C.), 1881.
—— Southern France and Italy. Report of a tour of inspection of Irrigation works in. VINCENT (C.), 1882.
—— Bouches du Rhône. BARRAL, 1876–78.
—— Pyrénées-Orientales. Irrigation Canals. PASSA, 1822.
—— Vaucluse. BARRAL, 1877.
India. BUCKLEY (R. B.), 1880, 1893; COTTON (Sir A.), 1875; DEAKIN, 1893; ELWES, 1869. Benefits. OLDHAM (R. A.). Financial aspects. OLIVER (E. E.); RUNDALL (F. H.), 1876; WILSON (H. M.), 1890, '91.
—— Canals of Irrigation, 1853. INDIA, p. 102.
—— Irrigation as a prevention of Famine. DACOSTA, 1878.
—— Formation of reservoirs in Indian rivers to provide irrigation. APPLEGARTH, 1881.
—— Irrigation in Southern India. Works constructed on the Rivers Cauvery, Kistnah, and Godavery. SMITH (Col. Richard B.), 1856.
—— Irrigation in Upper India. MCKINNEY, 1883.
—— Irrigation Works, 1861–70, 1865, 1889. INDIA, p. 102.
—— Periodical measurement of Irrigated Lands, 1865. INDIA, p. 102.
—— Agra district from the Ootunghun River, 1853. INDIA, p. 109.
—— Bahawalpur Canal Irrigation. Report, 1875–76. INDIA, p. 110.
—— Bengal Presidency. GREY (L. J. H.), 1875; ODLING (C. W.), 1893.
—— —— Irrigation in Bengal, 1861, 1883–84. INDIA, p. 110.
—— —— Bengal Irrigation Canals. ODLING (C. W.), 1893.
—— Bombay. Irrigation Projects Tank at Ekrookh, near Singapore, 1866. INDIA, p. 112.
—— —— Bhatodee Tank, 1867. INDIA, p. 112.
—— —— Lakh Project, 1866. INDIA, p. 112.
—— Ceylon. Reports, 1867–82, 1888, etc., 1890. INDIA, p. 115.
—— Deccan and Southern Maratha Country. INDIA, p. 112.

IRRIGATION—*continued.*

India. Godavari, Kistna and Cauvery Delta and Penner Anicut Systems, 1883. INDIA, p. 123.
—— Madras Irrigation Company. Report and Correspondence, 1860, '72. INDIA, p. 123.
—— Madras. Improvement of Works, 1867. INDIA, p. 123.
—— —— Reports, 1866–69. INDIA, p. 123.
—— Maratha (Southern) Country, 1866. INDIA, p. 126.
—— Maynee Project in Khuttaw Talooka, 1867. INDIA, p. 126.
—— North Western Provinces. Irrigation Revenue Reports, 1870–71, etc. INDIA, p. 127.
—— —— Irrigation Expenses, N.W. Provinces, 1856. INDIA, p. 127.
—— Periar Irrigation Project, 1886. INDIA, p. 128.
—— Pishin Valley. PISHIN V., 1890.
—— Punjab. Proposed scheme, 1865. INDIA, p. 129.
—— —— Irrigation Branch of Public Works Department, 1872–81. INDIA, p. 129.
—— Sind. Irrigation Revenue Report, 1892–93. INDIA, p. 131.
—— —— Sketch of Irrigation, with proposal for its improvement, 1855. INDIA, p. 131.
—— Travancore. Pandian Caul Head Works. HORSLEY, 1885.
—— Zhara Karez Irrigation Scheme. BELUCHISTAN, 1887.
Italy. PARETO, 1865.
—— Irrigation Canals of Northern Italy. BUFFON (N. de), 1861.
—— Lombardy. BRUSCHETTI, 1847.
—— Italian Irrigation. Agricultural canals of Piedmont and Lombardy. SMITH (Col. Richard B.), 1855.
Marchfeld Project. PODHAGSKY, 1877.
Madrid, Fields of, with the waters of the river Lozoya. RIBERA, 1866.
Milan. BRUSCHETTI; BERRA, 1822.
Portugal Rice Fields, Irrigation of. ANDRADE Corvo (J. de), 1869. Add. 480.
Prairies. KEELHOFF, 1856, 1888.
Spain. AYMARD, 1864. PASSA, 1823; ROBERTS (J. P.), 1867.
Sunday River Estate Irrigation Works. Plan. SPINDLER (H. L.), 1885.
Tragowel Plains Irrigation and Water Supply Trust. Chairman's Quarterly Report. TRAGOWEL, 1887.
United States. American Irrigation Engineering. WILSON (H. M.), 1890, '91, '94.
—— Arid regions. NEWELL, 1893.
—— Irrigation. UNITED STATES, p. 349.

IRRIGATION—*continued.*

United States. Investigation by the State Engineering Department. HALL (W. H.) and Perkins, 1882.

—— In the Arid West. HINTON, 1888.

—— California's great inland valleys. Necessity for Irrigation in. WRIGHT (J. W. A.), 1875.

—— Reclamation of arid lands by California. CALIFORNIA, 1889.

—— Southern California. CALIFORNIA, 1886.

—— Tulare Irrigation District, California. Reports on the projected works. TULARE District, 1890.

—— Irrigation problem in Montana. WILSON (H. M.), 1889.

West Indies. Vere district of the parish of Clarendon, Jamaica. COX (J. N.), 1879.

IVORY. South and East Africa. INGRAM (J. F.), 1889.

J.

JETTIES.

Advantages of employing a Frame-Work of Malleable Iron in the construction of Jetties. VETCH (J.), 1841.

Jetties for improving Estuaries. HAUPT (L. M.), 1888.

Training Jetties. Construction. SHELLSHEAR (W.), 1886.

Australia (South) Ocean Steamer Jetty. Correspondence relating to. SOUTH Australia, 1878, p. 227.

—— Report of Engineer. SOUTH Australia, 1878, p. 227.

—— Queensland. Proposed Jetty at Townsville. TOWNSVILLE, 1875.

Cumberland Sound. Jetty system as applied to the channel of entrance. Report. GILLMORE (Q. A.), 1876.

United States. Mississippi, Jetties at the mouth of the. CORTHELL, 1880; FORT St. Philip, 1874; EADS, 1876, 1879.

—— Acts of Congress relating to South Pass Jetties, 1875. MISSISSIPPI. Add. 521.

—— South Pass Jetties. AMERICAN Soc. of Civ. Eng., 1886.

River and harbour hydraulics. CORTHELL, 1884–86.

JEWELLERY. BEVAN (G. P.) Industries, vol. 11.

JOINERY, doors and windows. CLAYTON (A. G.), 1883.

JOINT STOCK COMPANIES.

Law and Practice. COX (E. W.), 1856; WORDSWORTH (C. F. F.), 1845.

Limited Liability Act. WORDSWORTH (C. F. F.), 1856.

JUTE. PFUHL, 1891.

K.

KILNS (CEMENT). Dietzsch Kiln for the continuous burning of Cement, Limestone and other materials.
TRECHMANN (C. O.), 1887.

KILNS (GAS). Dunnachie continuous Regenerative Gas Kiln for burning Fire-brick pottery. EGLESTON, 1886.

KINEMATICS. BURMESTER, 1888. Add. 489; CLIFFORD (W. K.), 1878; DWELSHAUVERS-Dery, 1866; PERIGAL (H.), 1849.

Kinematic effects of Revolution and Rotation.
PERIGAL (H.), 1850.

Kinematics of Mechanism. A new graphic analysis.
SMITH (Robert H.), 1885.

Kinetics. MORIN, 1861.

Modification of motion. MACCORD, 1883.

Transformation of a Kinematic Curve. PERIGAL (H.), 1846–49.

KNOWLEDGE, Pursuit of, under difficulties.
ANONYMOUS, 1830, p. 53.

Tables of indications of Human Knowledge.
ANONYMOUS, 1850, p. 45.

IRON TRADE—*continued.*

Industries (guns, nails, locks, hinges, etc.) BEVAN (G. P.), Industries, vol. 3.
Our Foreign Competitors in the. BELL (Sir I. L.), 1868, p. 120.
Potts' Mining Register and Directory for the Ironstone Trades. PERIODICAL PUBLICATIONS, p. 21.

Birmingham, Alabama. Iron Industry. KENT, 1892.
Cleveland. BELL (Sir I. L.), 1878, p. 119 ; GJERS, 1875.
Cumberland (West). Archæology. FLETCHER, 1880.
Fort Payne Coal and Iron Company. FORT PAYNE, 1888.
Germany, Iron Industry of. WEDDING (H.), 1880.
Great Britain, Manufacture of Iron in. WILKIE (G.), 1857.
Madras Presidency. Handbook. INDIA, p. 102.
Maryland Coal and Iron Company. Extracts from a report made to it. SILLIMAN (B.) and Sons, 1839.
Ohio (Southern). HUNT (T. S.), 1881.
Punjab, 1859, '83. INDIA, p. 129.
Scotland, Iron Trade of. ROWAN (F. J.), 1885.
United Kingdom, production. FOSSICK, 1886 ; MEADE, 1879.
—— British Iron Trade Association. BRITISH Iron Trade, 1877–90.
—— Iron industry in England. SIEMENS (Sir W.), 1878, p. 198.
—— Great Britain. GRIFFITHS (S.), 1873.
United States, history, 1621 to 1857. FRENCH (B. F.)
—— Resources. PUMPELLY, 1880.
—— Iron working industry. TRASENSTER (P.), 1885.

IRON (CAST).

Application of Cast and Wrought Iron to building purposes. FAIRBAIRN (Sir W.), 1854, p. 402.
Application of Hot-Blast in the Manufacture of. CLARK (Dr. T.), 1835.
Constituents. TURNER (Tho.), 1886.
Dimensions of Cast Iron at various temperatures. MILLAR (W. J.), 1881–82.
Experiments at Milton Iron-Works. Cast and Malleable Iron. MUSHET, 1843.
Experiments on its strength. YORK (J. O.), 1832.
Increased strength produced by the use of improved coke. CRACE-CALVERT, 1855.
Manufacture. FLACHAT, Barrault and Petiet, 1842–46 ; GUENYVEAU, 1835.
Mixtures of Cast iron and nickel, properties. FAIRBAIRN (Sir W.), 1858, p. 402.
Pig Iron. LEDEBUR, 1879.

IRON (CAST)—*continued.*

Pig Iron. Preliminary treatment of the materials used in the manufacture of Pig Iron in the Cleveland district.
BELL (Sir I. L.), 1871, p. 120.

Properties of Cast Iron and other Metals. MILLAR (W. J.), 1886.

Treatment. HEATON, 1869.

IRON (WROUGHT).

Art of tempering Wrought Iron. REAUMUR, 1722. App. 573.

United States. Report of the Committees on Malleable Iron, re-heating and re-rolling Wrought Iron (strength of wrought iron in bars and chains). UNITED States, 1878, p. 351.

IRON AND STEEL. BEVAN (G. P.), Industries, vol. 1; GREENWOOD (W. H.), 1884, '91; WÖHLER (A.), 1870.

American Iron and Steel Association.
AMERICAN Iron and Steel Association.

Antiquity. DAY (St. J. V.), 1874. Prehistoric use. DAY, 1877.

Brand Book of British Iron and Steel. GRIFFITHS (H. W.), 1883.

Burning. LEDEBUR, 1883.

Constructions. CONSIDÈRE, 1885–6.

Conversion of Forged Iron into Steel.
REAUMUR, 1722. App. 573.

Converting Iron into Steel. Softening Cast Iron.
REAUMUR (R. A. F. de), 1722. App. 573.

Corrosion. DAVIS (T. H.), 1886.

Different processes of manufacture. COUAILHAC, 1860.

Economic and social relations of production. PARIS, p. 456.

Elasticity, extensibility, and tensile strength. STYFFE (K.), 1869.

Engineering as applicable to Iron and Steel. NATHAN, 1883.

Essay on American Sand Iron, and Iron Ore, with methods of reducing into Pig or Sow Iron, and then into Bar Iron.
HORNE (H.), 1773. App. 562.

Essays. HORNE, 1773.

Estimation of Manganese in, by the Colour Method.
HUNT (A. E.), 1886.

—— Manganese, Carbon and Phosphorus in Iron and Steel.
HUNT (A. E.) and Clapp, 1885. Add. 509.

Forge, Foundry, Factory and Office. HOARE, 1876.

Formation of bars. PETZHOLDT (A.), 1874.

Galvanic action between wrought iron, cast metals and various steels during long exposure in Sea Water.
ANDREWS (T.), 1875.

Hydrogen and Nitrogen in. MÜLLER (F. C. G.), 1881.

Industries in foreign countries. FORBES (D.), 1873; IRON and Steel Inst., 1878.

IRON AND STEEL—*continued.*

Influence of temperature on the mechanical properties.
LE CHATELIER (A.), 1889.

Information and tables relating to the use of Wrought Iron and Steel. CARNEGIE, PHIPPS and Co.

Letters Patent for Improvements in the manufacture.
BESSEMER, 1857, 1886.

Letters Patent for Improvements in shaping, pressing and rolling malleable. BESSEMER, 1856.

Manufacture. KOHN, 1873. Cantor Lectures.
WILLIAMS (W. M.), 1876.

Manufacture of Steel and Ingot Iron from Phosphoric Pig Iron.
THOMAS (S. G.) and Gilchrist, 1882.

—— **Iron Ore Producers at Cresson, 1882.**
IRON and Steel Inst.

Mechanical, etc., properties of, in connection with their Chemical Composition. VOSMAER (A.), 1891.

Metallurgy, with special reference to American materials and processes. OSBORN, 1869.

National Convention of Iron and Steel Manufacturers and Iron Ore Producers. Proceedings, 1882.
NATIONAL Convention.

New method of casting. DORMOY, 1871.

Papers on. MUSHET (D.), 1848.

Passive state of Iron and Steel. ANDREWS (T.), 1890–91.

Principles of the Manufacture of. BELL (Sir I. L.), 1884, p. 120.

Puddling Iron and Steel, guide for. URBIN (E.), 1868.

Relative corrosion of. PHILLIPS (D.), 1890.

Relative electro-chemical positions of wrought iron, steels, cast metal, etc., in Sea Water and other solutions.
ANDREWS (T.), 1887.

Resistance and other properties. LOVE (G. H.), 1859.

Specifications of Improvements in the Manufacture.
MUSHET (R.), 1857.

Steam and water-power used in the manufacture.
HOLLERITH, 1888.

Strength and determination of dimensions and stability. Iron and Steel Constructions. WEYRAUCH (J. J.), 1877, '88.

Tensile Strength of American and English Iron and Steel.
THURSTON (R. H.), 1872.

Theoretical and Practical Treatise on the manufacture.
VALERIUS (B. and H.), 1875.

Trade. BELL (Sir I. L.), 1886, p. 119.

Transformation of Iron into Steel, by cementation.
BOUSSINGAULT, 1875.

IRON AND STEEL—*continued.*

Treatment of manufactured Iron and Steel for constructional purposes. How (W. F.), 1893. Add. 508.

Weight exported. Fossick, 1886.

Welding Cast Steel. Case of Mr. Heath, Inventor and introducer of the Manufacture of Welding Cast Steel from British Iron. Webster (Thomas), Q.C., 1806.

Whitworth. Improvements in Casting Iron and Steel. Minutes of evidence taken in the matter of the prolongation of Whitworth's patent, 1879. Whitworth (Sir J.).

—— Whitworth's Patent for Fluid-compressed Steel. Hearing of Sir J. Whitworth's Petition for a Prolongation. Whitworth (Sir J.), 1879.

Madras Presidency, 1855. Manufacture. India, p. 123.

United States, Industries of the. Colquhoun (W.), 1892.

—— Iron and Steel Production Statistics. Swank (J. M.), 1883.

—— United States Board appointed to test Iron and Steel and other metals. Report. United States, 1878–81, p. 351.

IRONWORKS. Dürre, 1882; Jonstorff, 1885; Kerpely, 1866–87; Styffe, 1868. Management of Iron Foundries. Dürre, 1892.

Creusot Works. Schneider (H.) and Co.

France. Comité des Forges de France. Comité, 1865, etc.

Grosmont. New Works. Coulthard, 1863.

India. Kumaon Government Ironworks, 1859. India, p. 121.

Languin. Survey and Estimate of the proposed Ironworks. Manby (E. O. and J.), 1841.

Park Gate Iron and Steel Works. Description. Rotherham, 1890.

Sweden. Ahrenberg, 1864. Ironworks, Mines, etc., province of Orebro. Blackwell (J. H.), 1864.

United States. American Iron and Steel Assoc., 1878–88; Bell (Sir I. L.), 1875, p. 119.

—— Saugus Ironworks at Lynn, Mass., etc. Woodbury (C. J. H.), 1892.

Wendel's Ironworks, Quality of products. Tetmajer, 1875.

IRRIGATION. Buffon (N. de), 1843; Cossigny, 1874; Culcheth, 1886; Donald (J.), 1861. Add. 497. Mullins, 1890; Ronna (A.), 1888–9; Villeroy (F.) and Muller, 1860.

Artificial Reservoirs for Rain Water, for the Irrigation of Land deficient in running water. Carena (G.), 1869. Add. 490.

Embanking, draining, and tilling land in tropical and other countries. Gibbs (Joseph), 1862.

Engineering (Irrigation). Wilson (H. M.), 1890, '93.

IRRIGATION—*continued.*

Irrigation Canals and other Irrigation Works. FLYNN, 1892.
—— Irrigation Works. THOMASON Civil Engineering Coll., 1862–4.
—— Practical Irrigator and Drainer. STEPHENS (George), Land Drainer, 1834.
—— National Irrigation; or, the various methods of watering meadows, etc. TATHAM (W.), 1801.
—— Notes on Continental Irrigation. ROTH (H. L.), 1882.
Management of Waters. COTARD, 1888.
Peat Bogs. Their Irrigation. SMITH (William), Engineer, 1806.
Political Economy of Irrigation. TATHAM (W.), 1799.
Productiveness. FORCHHEIMER, 1886.
Societies for Irrigation. RABBENO, 1878.
Vocabulary of terms peculiar to French and Italian Irrigation Works. BUFFON (N. de), 1869. Add. 489.
Water. Application of drainage water as a motive power to machinery for agricultural purposes. WILLIAMS (E. L.), senr., 1849.
—— Irrigation and water supply. SCOTT (J.), 1883.
—— Quantity of water consumed. CULCHETH, 1882.
—— Use of water in Agriculture. PARETO, 1851.
—— Water supply for Irrigation. NEWELL, 1894.
Wind Power, use of, for Irrigation. BROWNLOW (H. A.), 1877.
America (Central), Irrigation in. VICTORIA, 1885, p. 379.
Australia. Australian Irrigation Colonies Monthly Newspaper. PERIODICAL PUBLICATIONS, p. 12.
—— Australian Irrigation Colonies on the River Murray, in Victoria and South Australia. VINCENT (J. E. M.), 1888.
—— American and Australian. GORDON (G.), 1885.
—— India, lessons for Australia. CULCHETH, 1891.
—— Australia Irrigation works. CULCHETH, 1891.
—— Victoria. DEAKIN, 1886.
—— Victoria, Reports on the supply of water to the Northern Plains Irrigation. VICTORIA, 1882–4, p. 376.
—— Victoria Irrigation Reports. VICTORIA, 1886, p. 376.
—— Western Australia. DEAKIN, 1885.
Burma, British. Irrawaddy Circle Works. GORDON (R.), 1883.
Caucasus Irrigation Canals. GHERCEVANOFF, 1890.
Cowal Lake. Irrigation pumping plant. DONKIN (J. B.).
Egypt. BAROIS, 1887; BUCKLEY (R. B.), 1893; WILLCOCKS (W.), 1889.
—— Administration of the Irrigation Department, 1892, etc. GARSTIN.
—— Reports of the Administration for 1886–92. EGYPT, p. 384; Ross (Lt.-Col. J. C.), 1890–92; SCOTT-MONCRIEFF (Sir C. C.), 1868.

IRRIGATION—*continued.*

Egypt. The Fayum and Lake Mœris. BROWN (R. H.), 1892.
—— Perennial Irrigation and Flood Protection. EGYPT, 1894; WILLCOCKS (W.), 1894.
—— Lower Egypt. EGYPT, 1856.
—— Notes on the Distribution of Water and maintenance of works in the basin system of Upper Egypt. ROSS (Lt.-Col. J. C.), 1892.
France, Italy, and Spain, Development in. CALIFORNIA, 1886.
—— Irrigation works of France, Spain, Italy. Report of a tour of inspection. SCOTT-MONCRIEFF (Sir C. C.), 1868.
—— French and Italian Irrigation Laws. VINCENT (C.), 1881.
—— Southern France and Italy. Report of a tour of inspection of Irrigation works in. VINCENT (C.), 1882.
—— Bouches du Rhône. BARRAL, 1876–78.
—— Pyrénées-Orientales. Irrigation Canals. PASSA, 1822.
—— Vaucluse. BARRAL, 1877.
India. BUCKLEY (R. B.), 1880, 1893; COTTON (Sir A.), 1875; DEAKIN, 1893; ELWES, 1869. Benefits. OLDHAM (R. A.). Financial aspects. OLIVER (E. E.); RUNDALL (F. H.), 1876; WILSON (H. M.), 1890, '91.
—— Canals of Irrigation, 1853. INDIA, p. 102.
—— Irrigation as a prevention of Famine. DACOSTA, 1878.
—— Formation of reservoirs in Indian rivers to provide irrigation. APPLEGARTH, 1881.
—— Irrigation in Southern India. Works constructed on the Rivers Cauvery, Kistnah, and Godavery. SMITH (Col. Richard B.), 1856.
—— Irrigation in Upper India. MCKINNEY, 1883.
—— Irrigation Works, 1861–70, 1865, 1889. INDIA, p. 102.
—— Periodical measurement of Irrigated Lands, 1865. INDIA, p. 102.
—— Agra district from the Ootunghun River, 1853. INDIA, p. 109.
—— Bahawalpur Canal Irrigation. Report, 1875–76. INDIA, p. 110.
—— Bengal Presidency. GREY (L. J. H.), 1875; ODLING (C. W.), 1893.
—— —— Irrigation in Bengal, 1861, 1883–84. INDIA, p. 110.
—— —— Bengal Irrigation Canals. ODLING (C. W.), 1893.
—— Bombay. Irrigation Projects Tank at Ekrookh, near Singapore, 1866. INDIA, p. 112.
—— —— Bhatodee Tank, 1867. INDIA, p. 112.
—— —— Lakh Project, 1866. INDIA, p. 112.
—— Ceylon. Reports, 1867–82, 1888, etc., 1890. INDIA, p. 115.
—— Deccan and Southern Maratha Country. INDIA, p. 117.

IRRIGATION—*continued.*

India. Godavari, Kistna and Cauvery Delta and Penner Anicut Systems, 1883. INDIA, p. 123.
—— Madras Irrigation Company. Report and Correspondence, 1860, '72. INDIA, p. 123.
—— Madras. Improvement of Works, 1867. INDIA, p. 123.
—— —— Reports, 1866–69. INDIA, p. 123.
—— Maratha (Southern) Country, 1866. INDIA, p. 126.
—— Maynee Project in Khuttaw Talooka, 1867. INDIA, p. 126.
—— North Western Provinces. Irrigation Revenue Reports, 1870–71, etc. INDIA, p. 127.
—— —— Irrigation Expenses, N.W. Provinces, 1856. INDIA, p. 127.
—— Periar Irrigation Project, 1886. INDIA, p. 128.
—— Pishin Valley. PISHIN V., 1890.
—— Punjab. Proposed scheme, 1865. INDIA, p. 129.
—— —— Irrigation Branch of Public Works Department, 1872–81. INDIA, p. 129.
—— Sind. Irrigation Revenue Report, 1892–93. INDIA, p. 131.
—— —— Sketch of Irrigation, with proposal for its improvement, 1855. INDIA, p. 131.
—— Travancore. Pandian Caul Head Works. HORSLEY, 1885.
—— Zhara Karez Irrigation Scheme. BELUCHISTAN, 1887.
Italy. PARETO, 1865.
—— Irrigation Canals of Northern Italy. BUFFON (N. de), 1861.
—— Lombardy. BRUSCHETTI, 1847.
—— Italian Irrigation. Agricultural canals of Piedmont and Lombardy. SMITH (Col. Richard B.), 1855.
Marchfeld Project. PODHAGSKY, 1877.
Madrid, Fields of, with the waters of the river Lozoya. RIBERA, 1866.
Milan. BRUSCHETTI; BERRA, 1822.
Portugal Rice Fields, Irrigation of. ANDRADE Corvo (J. de), 1869. Add. 480.
Prairies. KEELHOFF, 1856, 1888.
Spain. AYMARD, 1864. PASSA, 1823; ROBERTS (J. P.), 1867.
Sunday River Estate Irrigation Works. Plan. SPINDLER (H. L.), 1885.
Tragowel Plains Irrigation and Water Supply Trust. Chairman's Quarterly Report. TRAGOWEL, 1887.
United States. American Irrigation Engineering. WILSON (H. M.), 1890, '91, '94.
—— Arid regions. NEWELL, 1893.
—— Irrigation. UNITED STATES, p. 349.

IRRIGATION—*continued.*

United States. Investigation by the State Engineering Department. HALL (W. H.) and Perkins, 1882.

—— In the Arid West. HINTON, 1888.

—— California's great inland valleys. Necessity for Irrigation in. WRIGHT (J. W. A.), 1875.

—— Reclamation of arid lands by California. CALIFORNIA, 1889.

—— Southern California. CALIFORNIA, 1886.

—— Tulare Irrigation District, California. Reports on the projected works. TULARE District, 1890.

—— Irrigation problem in Montana. WILSON (H. M.), 1889.

West Indies. Vere district of the parish of Clarendon, Jamaica. COX (J. N.), 1879.

IVORY. South and East Africa. INGRAM (J. F.), 1889.

LIGHT—*continued.*

Experimental determination of velocity of white and coloured light. YOUNG (J.) and Forbes, 1882.

Experiments respecting. YOUNG (Dr. T.), 1800.

Formula for determining optical constants of doubly Refracting Crystals. STOKES (Sir G. G.), 1846.

Intensity of Light in the neighbourhood of a Caustic. AIRY (Sir G. B.), 1848, p. 23.

Light and air, a text-book. FLETCHER (B.), 1886.

Light and Colour. Lectures. SPICE (R.), 1889.

Light and heat throughout the universe. Darkness in Egypt. FRASER (A. T.), 1885.

Means of providing building with light and solar heat. TRÉLAT (E.), 1887.

Measurement of Light. WYBAUW, 1885, '89.

Nature of the Light in the two rays produced by the double refraction of Quartz. AIRY (Sir G. B.), 1831, p. 21.

Nature and properties. HIGGINS (W. M.), 1829.

New species of coloured fringes produced by the reflection of light between two plates of parallel glass of equal thickness. BREWSTER, 1815.

Newton's experiments of Diffraction, calculation of. AIRY (Sir G. B.), 1833, p. 19.

Newton's observations on the inflections of light. JORDAN (C. W.), 1799, 1800.

Phenomena. HAUKSBEE, 1709, '19.

Refraction of rays of light. GYLDÉN, 1866.

Remarks on Faraday's paper on Ray-vibrations. AIRY, 1846, p. 22.

Researches on Light in its chemical relations. HUNT (R.), 1854.

Spectrum of the Sun and Spectra of the Chemical elements. KIRCHHOFF (G.), 1862–63.

Steel for striking a light, and lucifer matches. MAIGNE, 1878.

Superficial colour presented by a homogeneous liquid internally colourless. HERSCHEL (Sir J. F. W.), 1845.

Theory of Light and Colours. YOUNG (Dr. T.), 1802.

Theory of Reflectors, and Application on Collins's System. HOWARTH, 1879.

Titano-Silicic Glass. Its optic properties. STOKES (Sir G. G.) and Hopkinson, 1875.

Velocity of Light. FORBES (G.), 1879.

Verification of lenticular apparatus. CORNAGLIA, 1857.

Waves of Light. Corrections to the computed lengths. AIRY (Sir G. B.), 1871, p. 16.

Wave Theory of Light. LLOYD (H.), 1857; WEBER (Wilhelm), 1892–94.

LIGHT (ARTIFICIAL).

Gas-illuminated Buoy. PINTSCH's Patent Lighting Company, 1879.

Gas Buoys, Lightships, Lighthouses, Lightboats, Steamboats, etc. PINTSCH's Patent Lighting Company, 1881, 1885.

Mineral Oils. COLIN, 1870.

Pintsch's Gas. Carriage lighting on Continental Railways. PINTSCH's Patent Lighting Company, 1880.

Solid and Liquid Illuminating Agents. FIELD (L.), 1883.

South Kensington Museum. Its lighting. SOUTH Kensington Museum, 1869.

Treatise on Lighting. PECLET (E.), 1840.

Use of a mixture of spirit of wine and camphine as a light for optical purposes. CHILDREN, 1847.

LIGHT (POLARISED).

Effect of compression and dilatation in altering the polarising structure of doubly refracting crystals. BREWSTER, 1818.

Laws which regulate the distribution of the polarising force in plates, tubes and cylinders of glass. BREWSTER, 1818.

Lectures. ANONYMOUS, 1843, p. 48; PEREIRA (J.), 1854; SPOTTISWOODE (W.), 1879; WOODWARD (C.), 1848.

New Polarity of Light. AIRY (Sir G. B.), 1840, p. 22.

Polarisation and Inflection of Light. LECOUNT, 1836.

Vibrations of Plane. RANKINE (W. J. M.), 1850.

LIGHTERING and Wrecking Company, New Orleans. Laws, Act, etc. NEW ORLEANS, 1867.

LIGHTHOUSES. ADAMS (W. H. D.), 1878; RENARD (L.), 1881; RYDER (Capt. A. P.), 1864; STEVENSON (A.), 1840; STEVENSON (D.), 1864; STEVENSON (T.), 1882.

Ancient and Modern. HEAP (D. P.), 1889.

Apparatus and Lighthouse Administration in 1894. KENWARD (J.). Add. 513.

Characteristics. Correspondence, 1880. PARLIAMENTARY..Papers, p. 484.

Construction and Illumination. STEVENSON (T.), 1881.

Description of a Patent Screw-pile Battery and Lighthouse, 1843. MITCHELL (A.) and Son.

Dues received and Expenditure incurred on Lighthouses abroad, 1884–5, etc. PARLIAMENTARY..Papers, p. 483.

Estuaries and Rivers, more efficient lighting. DOUGLASS (W. T.), 1893.

Floating Lighthouse "Wandelaer." BOULVIN, 1884.

Floating and fixed Lighthouses. STEVENSON (D.), 1856.

Engineering, Lighthouse. Report. BARNARD (J. G.), 1879.

Establishment, Lighthouse. JOHNSON (A. B.), 1881.

LIGHTHOUSES—*continued.*

History, construction and illumination. STEVENSON (A.), 1850.
Improvements. LUIGGI, 1893.
Inspection of Local Lighthouses, buoys and beacons, 1885–87. PARLIAMENTARY..Papers, p. 484.
Instructions to Surveyors concerning Lights and Fog Signals, 1886. PARLIAMENTARY..Papers, p. 484.
Management. ANONYMOUS, 1861, p. 48.
Lighthouse Revenues and Expenditure, 1839. PARLIAMENTARY..Papers, p. 483.
Lighthouses and Beacons. COULIER, 1855, 1884–86.
—— British Colonies. GORDON (A.), 1847, 1861.
List of the Lighthouses of the World. FINDLAY (A. G.), 1879.
Means by which a seaman may identify Lighthouses. GURNEY, 1864.
Notes on their progress. STEVENSON (D. A.), 1893.
Sea Coasts of the World. ANONYMOUS, 1884, p. 43.
Specification for framing Lighthouses, piles, cylinders, &c. DOUGLASS (Sir J. N.), 1864.
Statistics. BABBAGE (C.), 1853.

Africa. Western Coasts, 1886. FRANCE, p. 437.
America, Coasts and Lakes of British North America, 1853. PARLIAMENTARY..Papers, p. 483.
—— Eastern and Western Coasts of South America and Western Coast of North America, 1853. PARLIAMENTARY..Papers, p. 483.
—— Western Coasts, 1886. FRANCE, p. 437.
—— (North). Eastern Coasts, 1886. FRANCE, p. 436.
—— (South). Eastern Coasts, 1886. FRANCE, p. 437.
Antilles, 1886. FRANCE, p. 436.
Atlantic islands, 1886. FRANCE, p. 437.
Australia (South). Lighthouses at Port Adelaide and off Cape Jaffa and on Troubridge Shoal. Plans, etc. SOUTH AUSTRALIA, 1866, p. 228.
Azov, Sea of, 1886. FRANCE, p. 436.
Baltic Sea, 1886. FRANCE, p. 436.
Belgian, Dutch, Hanoverian, Danish, Prussian, Russian, Swedish and Norwegian Lighthouses, 1854. PARLIAMENTARY..Papers, p. 483.
Bell Rock Lighthouse. An account of its erection. STEVENSON (R.), 1824.
—— Correspondence. RENNIE (Sir J.) and Stevenson, 1849.
Bermudas. Cast-iron Lighthouse Tower on Gibb's Hill. PATERSON (P.), 1850.
Black Sea, 1886. FRANCE, p. 436.

LIGHTHOUSES—*continued.*

Brazil, coast of. BARROSO, 1868.
British Isles, 1886. FRANCE, p. 436.
Ceylon. Proposed lights on the south-east coast. INDIA, 1863.
China, 1886. FRANCE, p. 437.
—— Lighthouses, Light-vessels, Buoys and Beacons. CHINA, 1872, etc.
—— Sea-lighting of the entrance of the Yang-tsze river. HENDERSON (D. M.), 1869.
Clyde Navigation. Report on River Lighthouses. HARVEY (J.), 1860.
Colonies (British) and Possessions, 1850. PARLIAMENTARY..Papers, 483.
Dunkirk. DUNKIRK, 1874.
Eckmuhl, Phare d', sur la pointe de Penmarc'h. BLOCQUEVILLE, 1893.
Eddystone Lighthouse, description of its construction. SMEATON (J.), 1793, p. 208.
—— Letters and documents relating to. WESTON (R. H.), 1811.
—— Practicability of removing the Eddystone rocks instead of rebuilding the lighthouse. EDDYSTONE, 1878.
—— New and Old. EDWARDS (E. P.), 1882.
—— New lighthouse. DOUGLASS (Sir J. N.), 1884; DOUGLASS (W. T.), 1885.
Europe. Tour of inspection in 1873. ELLIOT (G. H.), 1874.
—— North of, 1886. FRANCE, p. 436.
France, 1855, 1876, 1886. FRANCE, p. 436.
—— Lighthouses and Beacons. REYNAULD (L.), 1883.
—— French Lighthouses. WATSON (William), 1892.
—— Illumination and Beaconage of the Coast of France. REYNAULD (L.), 1864, 1876.
—— North and West Coast of France, Spain and Portugal, 1854. PARLIAMENTARY..Papers, p. 483.
—— France, United States, and England. Relative expenditure on. ALLARD (E.), 1880.
Galley Head Lighthouse. Report of Prof. Tyndall. GALLEY Head, 1879.
Galley Head and Howth Bailey Lights. HENDERSON (J.), 1883.
Godrevy Island in St. Ives Bay, erection of. GODREVY Island, 1858.
Goodwin and other sands. Proposed plan for a lighthouse on. WORTHINGTON (B.), 1840.
Goodwin Sands. Refuge Beacon. BULLOCK (F.), 1842.
India. List of Lighthouses and Light Vessels, including Red Sea and Coast of Arabia. INDIA, p. 102.
—— Construction of a Lighthouse on the Alguada Reef, 1858. INDIA, p. 109.

LIGHTHOUSES—*continued.*

India. Oyster Reef Lighthouse, 1888. INDIA, p. 128.

Indian Seas, 1886. FRANCE, p. 437.

Ireland. Irish Lighthouses. Copies of reports. IRELAND, 1865–84. Add. 511.

—— Report of Port of Dublin Corporation, 1864. IRELAND, p. 141.

Italy. ITALY, p. 147.

Lamlash. Suggestions for the alteration of its character. LAMLASH, 1880.

Maplin Sand. Lighthouse erected on Mitchell's screw piles. REDMAN (J. B.), 1849.

Mediterranean, 1886. FRANCE, p. 436.

—— Black Sea and Sea of Azof, 1853. PARLIAMENTARY..Papers, p. 483.

Mexico, 1886. FRANCE, p. 436.

Mumble's Head, co. Glamorgan. Bill, 1833. MUMBLE'S Head.

Poolbeg Lighthouse. POOLBEG, 1876.

Portugal. PORTUGAL, 1886.

Red Sea, Turkish and Egyptian Lighting and Light Dues. HODGKINSON (G.), 1893.

Queensland. QUEENSLAND, 1886, p. 71.

—— Lighted Beacons and Floating Lights. QUEENSLAND, 1891, p. 71.

Scotland. Institution and progress of Northern Lighthouses. STEVENSON (R.), 1824.

—— Prayer for the use of those employed in the Lighthouse service. BRUNTON (Rev. A.), 1820.

Spain. SPAIN, pp. 234, 235.

—— West Coast, 1886. FRANCE, p. 436.

Suez Canal. Three Lighthouses destined for lighting the coast of Egypt. SUEZ Canal, 1869.

Sunderland. Removal of the Lighthouse. MURRAY (John), 1844.

Sweden, 1872–85. SWEDEN, p. 270.

Tyne improvement. Report on the proposed abolition of Tynemouth light and the substitution in its stead of a light on Souter Point. TYNE River, 1870.

Tynemouth. FARRER, 1870.

United Kingdom. Review of Lighthouse Work and Economy, 1837–87. KENWARD, 1887, '91.

—— British Islands, 1851–56. PARLIAMENTARY..Papers, p. 483.

—— Admiralty list of Lights, 1876. PARLIAMENTARY..Papers, p. 482.

—— Coasts of Great Britain and Ireland, 1841-44. PARLIAMENTARY..Papers, p. 483.

LIGHTHOUSES—*continued.*

United Kingdom. British Lighthouse System. Letter.
STEVENSON (A.), 1833.

—— British Lighthouse Chart-Key. HARDINGE, 1874.

—— British Pharos: or a list of the lighthouses of Great Britain and Ireland and description of the appearance of the lights by night. STEVENSON (A.), 1831.

—— Great Britain. REDMAN (J. B.), 1843.

—— English and Scotch Lighthouse lanterns.
STEVENSON (D. & T.), 1868.

—— Applications to Commissioners respecting Northern Lighthouses, 1851. PARLIAMENTARY..Papers, p. 483.

—— Report of Committee, 1834.
PARLIAMENTARY..Papers, p. 483.

—— Reports from Select Committee, 1843-45.
PARLIAMENTARY..Papers, p. 483.

United States. Lighthouses, beacons, and floating lights of the United States, 1853. PARLIAMENTARY..Papers, p. 483.

—— Reports, Public Documents, Laws, &c.
UNITED STATES, p. 350.

West India Islands and adjacent coasts, 1853.
PARLIAMENTARY..Papers, p. 483.

—— Lighthouses. WEST Indies, 1853.

Wolf Rock. Bronze or cast-iron columnal Lighthouse.
BROWN (Sir S.), 1836.

See also BEACONS, BUOYS, SEA LIGHTS.

LIGHTHOUSES (ILLUMINATION, GENERAL REFERENCES).

Apparatus, Luminous power of Lighthouse. BOURDELLES, 1893.

Apparatus of Lighthouses, optical properties of.
RIBIÈRE (C.), 1894. Add. 530.

Cathadioptric Zones, application of, to lights of the first order in the system of Fresnel. STEVENSON (A.), 1840.

Composition of the Lighthouse Illuminants Committee, 1883–4.
PARLIAMENTARY..Papers, p. 484.

Condensing, Intermittent and Revolving Lights.
STEVENSON (T.), 1872.

Correspondence on the characteristics of Lights, 1880.
PARLIAMENTARY..Papers, p. 483.

Correspondence on the last Return on the subject of Lighthouse Illuminants, 1893. PARLIAMENTARY..Papers, p. 484.

Dioptric Lights, invention of, and introduction into Great Britain. BREWSTER, 1867. Memorial. BREWSTER, 1859. Reply to Brewster. STEVENSON (D. & T.), 1859, '60.

Dioptric lights and accessories. CHANCE Brothers, 1876, '86.

"Fixed" and "Occulting" Optical Apparatus.
KENWARD, 1890, '92.

LIGHTHOUSES (ILLUMINATION, GENERAL REFERENCES)—*continued.*

Flashing (Group) Lights, 1874. HOPKINSON (J.).

Gas and Electric Light, comparison of, with optical apparatus of large dimensions. LO GATTO, 1893.

Gas compared with Electric Light for Lighthouses. WIGHAM (J. R.), 1881.

Gas for Lighthouses. TYNDALL (J.), 1883, p. 334.

Gas Lighting. PINTSCH'S Patent Lighting Co., 1881, 1885.

—— Proposal to substitute gas for oil, 1869–75. PARLIAMENTARY..Papers, p. 484.

Holmes' Magneto-electric Light. HOLMES (F. H.), 1862.

Holophotal system of illuminating lighthouses; a description of the light of maximum intensity. STEVENSON (T.), 1851, '59, '61.

—— Holophotal combination of several flames in one optical apparatus. STEVENSON (T.), 1876.

Illumination. Lighthouse Illuminants, 1887, '8, '9. PARLIAMENTARY..Papers, p. 484.

—— Illumination. PIGOT, 1879.

—— Different modes. BARLOW (W. H.), 1837.

Improvement in Lighthouse Lights. WIGHAM (J. R.), 1893.

Lanterns, 1870. PARLIAMENTARY..Papers, p. 484.

—— Comparative advantages of the Lighthouse Lanterns adopted by the Trinity House and the Commissioners of Northern Lighthouses, 1868. PARLIAMENTARY..Papers, p. 484.

Lens, Giant Lighthouse Lens: quadrilateral arrangement, etc. WIGHAM (J. R.), 1893.

—— Hyper-radial and other recent Lenses. KENWARD, 1889.

—— Proposed spherico-cylindric and double cylindric lenses. STEVENSON (T.), 1855.

—— Report to the Committee of the Commissioners of Northern Lights on the illumination of lighthouses by means of lenses. STEVENSON (A.), 1835.

New form of intermittent Light. STEVENSON (R. L.), 1871.

New system of lighting lighthouses. FRESNEL (A. J.), 1822, p. 558.

Oil. Proposals to substitute Mineral Oils for Colza Oil, 1871–74. PARLIAMENTARY..Papers, p. 484.

—— Return of Lighthouses and Light Vessels where mineral oil is substituted for Colza, 1875. PARLIAMENTARY..Papers, p. 484.

Revolving lights. Application of the principal of total reflexion. STEVENSON (T.), 1855, '56, p. 254–5.

Ventilation of Lighthouse lamps. FARADAY (M.), 1843.

Visibility of Lights in rapid motion. Experiments made with a view to the improvement of lighthouses. STEVENSON (A.), 1842.

Ailsa Craig. Oil-gas work and Fog signal machinery. HUNTER (G. M.), 1887.

LIGHTHOUSES (ILLUMINATION, GENERAL REFERENCES)—*continued.*

Copeland Island Lighthouse Illumination. Adoption of Gas instead of Oil. COPELAND, 1880–82.

France. FRANCE, p. 436.

Inchkeith. Report on the new Dioptric light. STEVENSON (A.), 1835.

Isle of May. New Dioptric Light. Report, 1836. ROYAL Society of Edinburgh ; STEVENSON (A.), 1836, p. 250.

Skerryvore Lighthouse. Account with notes on the illumination of lighthouses. STEVENSON (A.), 1848.

Tay leading lights. Lighthouse Illumination, including those of the. STEVENSON (T.), 1868.

LIGHTHOUSES (ILLUMINATION : ELECTRIC LIGHT).

Electric Machinery and Arc light. BLONDEL, 1893.

Electricity. Apparatus exhibited at Chicago Exhibition, 1893. CHICAGO.

Electricity, Gas, and Oil as Lighthouse Illuminants. Report of the Committee. TRINITY House, 1885.

Relative merits of Electricity, Gas and Oil, 1885. PARLIAMENTARY. . Papers, p. 484.

Reports of Electrical Communication Committee on electrical communication between Light-vessels and the Shore, 1887–89. Report of Royal Commission, 1893. PARLIAMENTARY. . Papers, p. 485.

Some objections to the use of electric light. ALLARD (E.), 1882.

Use of Electric Light. PETIT (L.), 1881.

France, Coasts of. Use of Electric Light. ALLARD (E.), 1881 ; FRANCE, p. 437.

—— Hève electric lighthouses. FRANCE, p. 437 ; QUINETTE de Rochemont, 1870.

Isle of May. Description of the Electric light on. STEVENSON (D. A.), 1887.

South Foreland. Correspondence and reports on the subject of comparative trials of Electric Lights at. TRINITY House, 1877.

LIGHTING OF TOWNS. DARCEL, 1878.

Municipal Lighting. WHIPPLE (F. H.), 1888.

Science and Practice of Lighting as applied to Streets, open spaces and interiors. WEBBER (W. H. Y.), 1892.

Hornsey. Report of Lighting Committee, 1882. HORNSEY Local Board.

London. Houses of Parliament. HOUSES of Parliament, 1852, '66.

LIGHTNING.

Action of Lightning, and means of defending life and property. PARNELL (A.), 1882.

LIGHTNING—*continued.*

Defence of Ships and Buildings from lightning. HARRIS (W. S.), 1835, 1840. App. 560.

Destructive action on buildings. GRAY (J. W.), and Son, 1873.

Lightning Calculator. DE BOTWOR, 1890.

Lightning Protection, treatise. SPANG (H. W.), 1883.

Loss of Life and Property by Lightning. MCGREGOR, 1886.

Means of protecting buildings and shipping. HARRIS (Sir W. S.), 1843.

Protection of Ships from the effects of Lightning (Harris's Lightning Conductors), 1840. PARLIAMENTARY..Papers, p. 485.

Shipwreck by Lightning. HARRIS (Sir W. S.), 1852.

LIGHTNING CONDUCTORS. ANDERSON (R.), 1878, '79, '85; GRAY (J. W.) and Son, 1873; KERNOT, 1886; KLASEN (L.), 1879; WILSON (Robert), 1877.

Electricity of Thunderstorms. KARSTEN (G.), 1880.

Harris's Conductors. Shipwreck by Lightning. HARRIS (Sir W. S.), 1852.

Lightning Rod Conference. Report, 1882. LIGHTNING Rod.

Pointed Conductors. Principles of Electricity with analysis of the superior advantages of high and pointed conductors. MAHON (Viscount), 1779. App. 567.

LIMES.

Hydraulic Lime. Artificial Hydraulic Lime. PRICE (W. H.), 1867.

Lime. JOHN (J. F.), 1819.

Lime-burning at the port of Brest. PETOT, 1833.

Lime-burning Cements; hydraulic mortars. LEJEUNE, 1886.

Limes. THOMASON, Civil Engineering Col., 1862–4.

Limes and Cements. Nature and properties. SCOTT (Capt. H.), 1861–62.

Manual of Lime. HEATH (A. H.), 1893.

Manufacture. BONNAMI, 1888.

Preparation of Lime by the Romans. LA FAYE, 1777.

Rudimentary treatise. BURNELL, 1850.

Theory of Lime. FAUJAS de Saint-Fond (B.), 1778. Add. 500.

Treatise on Calcareous and Hydraulic Limes. AUSTIN (J. G.), 1862.

See also CEMENTS.

LINEN.

Linen Manufacture, Ireland, Acts of Parliament, 1802. IRELAND, p. 141.

Manufacture of Linen threads and tapes, 1744. PARLIAMENTARY..Papers, p. 485.

State of Linen Manufactories, 1751. PARLIAMENTARY..Papers, p. 485.

State of the Linen Trade, 1773. PARLIAMENTARY..Papers, p. 485.

LINKAGES. Linkages: different forms and uses of articulated links. Roos (J. D. C. de), 1879.

LINOLEUM. History and manufacture. Fischer (H.), 1888.

LIQUIDS.

Compressibility of. Barus, 1892; Colladon and Sturm, 1887.
Dielectric capacity of Liquids. Hopkinson (J.), 1881.
Electrostatic Capacity of. Hopkinson (J.), 1877, '81.
Expansion of Liquids by heat, formula for calculating. Rankine (W. J. M.), 1849.
Subsidence of fine solid particles in. Barus, 1886.
Volume thermodynamics of. Barus, 1892.

LITERATURE.

Adventures of Hatim Tai, a Persian Romance. Hatim Tai.
Anglo-Saxon literature and learning. Wright (Tho.), M.A., 1839.
Junius, Letters of. Authorship of. Britton, 1848.
Language and Literature of Persia. Goldsmid, 1892.
Lauterdale: a story of two generations. Fogerty, 1873.
Literature and its professors. Purnell, 1867.
Literature of the Middle Ages (Villemain). Lovelace, 1850.
Vidore: a tale. Vyse (G. W.), 1888.

LITHOGRAPHY.

Photo-chromo-lithography. Griffiths, 1882.
Specimens of a new style. Hullmandel, 1829.

LOANS.

Borrowing of Money by the Corporation of Portsmouth. Act. Portsmouth, 1883.
Province of Auckland Government Loan. Auckland, N.Z., 1863.

LOCAL GOVERNMENT.

County government in Combination with Union organisation. Chadwick (Sir E.), 1879, p. 235.
Digest of the Law. Chambers (G. F.), 1875.
Local Self-Government: Its rights, duties, and Importance. Smith (Joshua Toulmin), 1849.
Local Improvements. Index to Reports, 1809–34. Parliamentary..Papers, p. 485.
Reports on Provisional Orders (No. 3) Bill, 1884. Parliamentary..Papers, p. 485.

Barking Parish Act, 1888. Barking.
Belfast Local Acts, 1845–87. Belfast.
Birmingham, Act for improving. Birmingham, 1851.

LOCAL GOVERNMENT—*continued.*

Bolton. Act for improving the town. BOLTON, 1847.
Bournemouth, public works. ANDREWS (G. R.), 1885.
Buenos Ayres. City Improvements. BUENOS Ayres, 1874.
—— Future capital of the province. BUENOS Ayres, 1881, 1882.
—— Debates of the Constituent Assembly, 1870–73. BUENOS Ayres.
Burnley. Act for improving the town. BURNLEY, 1846.
Cheltenham, Act for improving. CHELTENHAM, 1852.
Chesterfield Borough Extension and Improvement Bill. CHESTERFIELD, 1876.
Edinburgh, Leith, and Portobello Corporations. Report. BATEMAN (J. F. La T.), 1869.
Ireland. Alternative Remedies for. CHADWICK (Sir E.), 1887, p. 234.
Llanelly Local Board Act, 1888. LLANELLY.
London. Local Government Board Reports, 1871, etc. PARLIAMENTARY..Papers, p. 485.
—— Metropolitan Board of Works. Minutes of Evidence on Bill, 1874. LONDON, p. 262.
—— Minutes of Proceedings, 1858–87. Reports, 1858–89. LONDON, p. 262.
—— Receipts and Expenditure, 1889. LONDON, p. 262.
—— Metropolitan Local Management Act abridged. ANONYMOUS, 1855, p. 55.
Loughborough Local Board Bill. Minutes of Evidence, 1886. LOUGHBOROUGH.
Manchester. Imperfect Local self-government and its results in Manchester. CHADWICK (Sir E.), 1883, p. 235.

See also MUNICIPALITIES.

LOCKS.

Hydro-Pneumatic lock and locks in general. CONGREVE, 1814.
New mode of filling and emptying. ANONYMOUS, 1825, p. 49.
Brentford proposed lock. Report to Conservators of the Thames. COODE (Sir J.) and Calver, 1873.
Dunkirk. DUNKIRK, 1874.
Goedereede. Account of the tidal lock. GREVE (A.), 1851.
Gravelines. Vauban lock reconstruction. GRAVELINES, 1872.
Wensum. Proposed lock upon the River Wensum, at Norwich. EDWARDS (G.), 1838; WALKER (James) and Burges, 1838.

LOCKS (LOCK GATES).

Lock Gates, project for a new construction. SINGELS (J. C.), 1839.
Mitering Lock Gates. HODGES (H. F.), 1892.

LOCKS AND KEYS. BRAMAH, 1815, 1851; CHUBB, 1850; PRICE (G)., 1856.

Bramah Lock Controversy. ANONYMOUS, 1851, p. 41.
Fenby's (J. B.) Patent Locks. HOBBS (A. C.), 1868.
Gunpowder Proof Locks. PRICE (G.), 1860.
Gunpowder Proof Lock Chambers. PRICE (G.), 1860.
Hobbs's American Lock. HOBBS (A. C.), 1860.

LOCOMOTION.

Journal of Elemental Locomotion. PERIODICAL Publications, 1832, p. 18.
Rapid transit for New York. EVANS (W. W.), 1875.

LOCOMOTIVES (GENERAL REFERENCES).

CUMMING (T. G.), 1824; FADDA, 1886; FADDA, Olivetti & Silvota, 1880–90; FLACHAT (E.) and Petiet, 1839, '40; LE CHATELIER (L.) and others, 1859, 1868; OPPIZZI, 1890. Add. 524; RICHARD and Badé, 1881; SCHALTENBRAND (C.), 1876.

Agricultural Locomotives. AVELING (T.), 1878.
Articulated locomotive. COUCHE, 1863.
Catechism of the Locomotive. FORNEY, 1875.
Construction, etc., of Locomotives. HEUSINGER von Waldegg, 1870. Add. 507; HUGHES (G.), 1894. Add. 509; JULLIEN (C. E.), 1862; MEYER (J. G. A.), 1892. PETZHOLDT (Alphons), 1875; REDTENBACHER, 1855; STEPHENSON, R. & Co. 1887; WEBER (H.), 1871.
Disadvantageous Action of Locomotive Engines upon Curved Roadway. HOADLEY, 1860.
Design (new) for Locomotive Engines. CRAMPTON, 1886.
Development (Locomotive). STRETTON (C. E.), 1889, 1892.
Electric. Raffard elastic coupling. RAFFARD, 1892.
Electro-automotor whistle. LARTIGUE & Forest, 1873.
Electro-Dynamic Locomotive. SCHALTENBRAND (C.), 1879.
Engine Driving (Locomotive). REYNOLDS (M.), 1878, p. 106.
—— Engine-Driving Life. REYNOLDS (M.), 1882, p. 106.
Engineman's Pocket Companion. REYNOLDS (M.), 1886.
Examination of Engine Drivers. BROSIUS and Koch, 1879.
Express Locomotive with fore-carriage. ERLACH, 1855.
Guide to the Locomotive Engine. ANONYMOUS, 1849, p. 56.
Hammer-blow in. BOOTH (W. H.), 1887.
Handbook of the Locomotive. ROPER (S.), 1883.
High-speed locomotive of 750 H.P. BÉOTHY, 1889.
High Speeds. A letter. STEPHENSON (G. R.), 1861.
Indicator trials. BAUSCHINGER, 1868.
Inventor. HEDLEY (O. D.), 1858.
Invention of "Improvements in locomotive engines." McCONNELL, 1852.

LOCOMOTIVES (GENERAL REFERENCES)—*continued.*

Letters Patent for Improvements in Trucks for Locomotive Engines. BISSELL, 1858.
Locomotive Engine running and management. SINCLAIR (A.), 1885.
Locomotive Engineering. COLBURN, 1871.
Locomotive Engines. What they are, and what they ought to be. FAIRLIE, 1864.
Locomotive without fire-box. FRANCQ, 1876, '80.
Locomotives with outside cylinders. PIMENTEL, 1874, '76.
Longridge's Patent Locomotive. LONGRIDGE, 1885.
Management of a Locomotive Engine. GREGORY (Sir C. H.), 1841; SEWELL (J.), 1848.
Manufacture of. ANONYMOUS, 1831, p. 51.
Model Locomotive Engineer, Fireman and Engine Boy. REYNOLDS (M.), 1879.
Meyer's system. MEYER, 1871.
New Patented System for Locomotives with wheels with two tires. COTTRAU, 1882.
Performances of the different locomotive engines at, and subsequent to, the Liverpool Contests. WOOD (N.), 1831, '38.
Power of Locomotive Engines. BARLOW (P.), 1837, 1851.
Power at different velocities. BARLOW (P.), 1839.
—— Relative powers of the Locomotive Engine and the resistance of railway gradients. FAIRBAIRN (Sir W.), 1851, p. 401.
Propelling Locomotive Machines, new method of. MANN (W.), 1830.
Railways, advantages of, with Locomotive Engines, 1833. LONDON and Greenwich Railway; PAMBOUR, 1835, '36, '40.
—— Performance of Locomotive Engines on Railways. RANKINE (D.), 1828.
Railways and Locomotives. BARRY (J. W.) and Bramwell, 1882; HERBERT, 1837.
Recent Locomotives. NEALE, 1883, 1886.
Recent practice. CLARK (D. K.) and Colburn 1860.
Report. SYLVESTER (C.), 1825.
Report on express locomotive with movable forepart (bogie). ERLACH, 1855.
Resistance, fuel consumption and power exerted. FRANK (A.), 1886.
Resistance of passenger trains. REGRAY, 1881.
Specifications for Locomotive Engines, 1882. LONDON, Chatham and Dover Railway.
Stationary Engines, Observations on the comparative merits of locomotive and. STEPHENSON (R.) and LOCKE, 1830.
—— Liverpool and Manchester Railway. RASTRICK, 1829; WALKER (James), 1829, p. 394.

LOCOMOTIVES (GENERAL REFERENCES)—*continued.*

Steam-jet or blast, invention of. Smiles's mistaken claim for George Stephenson. GURNEY, 1859.

Steam power, application to railways. GLYNN, 1833.

—— Production and employment of steam considered as a motive force. LENCAUCHEZ and Durant.

—— Use of counter-pressure steam as a brake. LE CHATELIER (L.), 1869, '70.

Traction by means of steam locomotives without fire. LAMM and Francq, 1888.

Treatise, rudimentary. DEMPSEY, 1866, 1879.

Use of Locomotive Engines. NAVIER, 1836.

Vaporisation of, in relation to draught. GERHARDT, 1878.

Water for Locomotive Engines and its chemical analysis. WEST (W.), 1846.

Weights. Paying and non-paying weights pulled by the Locomotive Engine in 1867. HAUGHTON (B.).

American Locomotive. PEALE (L. T.), 1887.

—— American *v.* English Locomotives. EVANS (W.W.), 1880; EVANS &c., 1880.

—— Modern American Locomotive Engines. EDWARDS (E.), 1883.

—— Locomotives and Locomotive Building. FORNEY, 1886.

—— American Locomotive Engineering. WEISSENBORN (G.), 1879.

Australian (South) Railway Engines, their weight. SOUTH Australia, 1877, p. 229.

British (English). DEMOULIN, 1885.

—— Acts, 1861–1872. GLEN (A.).

—— British Locomotives. COOKE (C. J. B.), 1823.

—— and Foreign Railway Locomotive Engine. BRITISH and Foreign, 1847.

—— Rainhill locomotive trials. Commemoration of the Jubilee. WEBER (M. M. von), 1879.

—— Great Western Railway, Report to directors of, relating to Locomotive department. HAWKSHAW (Sir J.), 1838. Add. 506.

—— London and North Western Railway. General Locomotive Committee Reports. WOODS (E.) and Marshall, 1853–4.

—— "Marchioness of Stafford." Engraving. WEBB (F. W.), 1888.

—— London and South Western Railway Coal and Coke burning Engines. FOTHERGILL, 1856.

—— Newcastle and Carlisle Railway. Experiments of two locomotives, the "Sun" and "Star." HAWTHORN (R. and W.), 1840.

LOCOMOTIVES (GENERAL REFERENCES)—*continued.*

British. Newcastle-upon-Tyne and North Shields Railway. Experiments of "Collingwood" and "Exmouth" as to consumption of coke and water. NICHOLSON (R.) and Hawthorn.

Burmah. Contracts for Ironwork for Locomotive Engines and Tenders. INDIA, p. 114.

France. Three types of Locomotives. Chemin de fer du Nord. (London Exhibition, 1862.) PETIET (J.), 1862.

New South Wales. Trials of a ten-wheeled Baldwin Engine, 1892. NEW SOUTH WALES, p. 404.

—— Alleged defectiveness and unsuitability of the Baldwin locomotives, 1892. NEW SOUTH WALES, p. 404.

—— Fifty Colonial-made Railway Locomotives, 1889. NEW SOUTH WALES, p. 404.

—— Tests with the new American engines. NEW SOUTH WALES, p. 404.

New Zealand. Coal as a fuel for Locomotives, 1876, '77. NEW ZEALAND, p. 408.

—— Relative merits of American and English Locomotives, 1879–80. NEW ZEALAND, p. 412.

Reading Railroad, Locomotive Engines on the. Report on the use of anthracite coal in. WHISTLER (G. W.), 1849.

Victoria. Return relative to Railway Locomotives, 1871. VICTORIA, p. 378.

Vienna Exhibition of 1873. DEGHILAGE and Morandière.

LOCOMOTIVES (ADHESION OF).

Adhesion to rails for curves of a small radius. MALLET (A.), 1894. Add. 518.

Locomotive Adhesion. ANONYMOUS, 1865, p. 48.

LOCOMOTIVES (COMPOUND).

Compound Locomotives. ANONYMOUS, 1885, p. 42; BAUDRY, 1889; BORRIES, 1886; LAPAGE, 1889; MALLET (A.), 1880, 1890; POLONCEAU (E.), 1889; WORSDELL (T. W.) and von Borries, 1887.

Compound Locomotive of the Rhode Island Locomotive Works. Report. FRANKLIN Institute.

Four cylinders (Northern Railway of France). BOUSQUET (T. B. G. du), 1892.

Simple *v.* compound. SMITH (W. M.), 1892.

Mallet's system. FETTER, 1891.

South West Russian Railways. System compound-tandem. BORODINE, 1892.

LOCOMOTIVES (COAL CONSUMPTION).

Consumption of Fuel. FRANK, 1886; MARIÉ, 1884.

—— and Evaporation of water in Locomotives. FRANK, 1886; WOODS (E.), 1850.

Liverpool and Manchester Railway Locomotive Engines, Consumption of fuel. WOODS (E.), 1844.

Patent apparatus for consumption of coal without smoke. HALL (S.), 1842.

Use of coal in Locomotive Engines. WOODS (E.) and Marshall, 1854.

LOCOMOTIVES (ROAD).

Epitome of the Road Locomotive Acts. AVELING T. (1878).

Reports of Select Committees on Locomotives on Roads, 1871, '73. PARLIAMENTARY..Papers, p. 485.

Tramway Locomotive. WILKINSON & Co., 1884.

See also STEAM TRACTION on Roads; TRAMWAYS (Mechanical Power).

LOCOMOTIVES (AXLES).

Crank Axles. EVANS (W. W.), 1884.

Locomotive Driving Axles, Breaking of. STRETTON (C. E.), 1885.

LOCOMOTIVES (VALVES). Valve Gears, with special consideration of the Link-motions of Locomotive Engines. ZEUNER (G.), 1869, '83.

Link Motion. History of the Invention. BURGH (N. P.), 1870.

Link motion and Expansion Gear. BURGH (N. P.), 1870.

LOCOMOTIVES (WHEELS). BIGLIA, 1893. Add. 485. Repair. BIGLIA, 1889–93. Add. 485.

Adherence of Wheels. BONNIN, 1888.

LOCOMOTIVES (FOR STEEP INCLINES).

Fairlie's Engines, Construction and Working. BERKLEY (Sir G.), 1870. Experiments. FAIRLIE, 1870.

—— Refutation of attacks. FAIRLIE, 1876–78.

—— Opinions of the press. FAIRLIE, 1868.

Locomotives for ascending steep inclines with sharp curves. HALL (J. G.) (1864).

St. Gothard mountain line. MASSA, 1880.

LOCOMOTIVES (BOILERS).

Locomotive Boiler. RICHARD (G.), 1886.

—— Coal burning, Europe. COLBURN and Holley, 1858.

—— New type of boiler. FADDA (S.), 1890.

—— Steam-generating power of Locomotive Boilers. WILLIAMS (C. W.), 1864.

—— Strength, and causes which lead to explosion. FAIRBAIRN (Sir W.), 1854, p. 401.

LOGIC.

De arte logistica. NAPIER (John), 1839.
Induction and Deduction. LIEBIG, 1865.

LOGARITHMS.

Doctrine of Logarithms. MARTIN (B.), 1740. App. 567.
Hyperbolic Logarithms, from 1 to 10,000. BARLOW (P.), 1814, 1840.
Logarithmic calculating machine. TETMAJER, 1875.
Logarithms. MASERES, 1760.
Logarithms of numbers from 1 to 10,000. ANONYMOUS, 1850, p. 48.
—— From 1 to 108,000. BABBAGE (C.), 1872.
Short Logarithmic and other tables. UNWIN (W. C.), 1876, '90, p. 360.
Tables. CALLET, 1846.
Theory of the various Orders of Logarithmic Transcendents. SPENCE (William), 1809.
Treatise. LAW and Young, 1879.

LODGING HOUSES (LONDON). Report on Common and model Lodging Houses, 1855. Rules and Regulations, 1852. LONDON, pp. 262, 269.

LONGITUDE.

Borda and Pingré's voyage in different parts of the world to verify the use of various methods and instruments serving to determine the Latitude and Longitude. VERDUN de La Crenne, 1778. App. 579.
Chronometer, Use of the, with suggestions for applying it to correct the Latitude as well as the Longitude. OWEN (E. W. C. R.), 1812. App. 570.
Discovery of the Longitude. ANONYMOUS, 1763, p. 40.
—— Account of the proceeding in order to the discovery. ANONYMOUS, 1763. App. 544.
—— Longitude discovered by Eclipses, etc., and Conjunctions of Jupiter's Planets. WHISTON (W.), 1738.
—— Graphor, Longitude discovered by a. DEGRAVORS (P.), and Ould, 1794. App. 553.
—— Fluid Quadrant, Description of, for Latitude and discovery of Longitude by everlasting Horometer. ROWE (Capt. Jacob), 1725. App. 574.
Letter on Longitude. ARNOLD (John), 1781. App. 545.
Letter. Answer to a letter on Longitude. ARNOLD (1782); ARNOLD, 1782. App. 545.
Maskelyne's Pamphlet. Remarks on, and Extract from Harrison's reply to remarks and objections. HARRISON (John), 1767, '68. App. 561.

LONGITUDE—*continued.*

Moon. Attempts to discover Longitude by.
HARRISON (John), 1775. App. 560.

—— Method of determining Longitude by means of observations on the moon's greatest altitude. SPOTTISWOODE (W.), 1860.

—— Method of finding the Longitude by the apparent true place of the moon at Sea, etc. ANONYMOUS, 1834. App. 544.

—— Methods of Lunar observations for finding Latitude and Longitude.
HARRISON (Thomas and James), 1788. App. 561.

Needle, Longitude and Latitude found by the Inclinatory or Dipping. WHISTON (W.), 1721. App. 580.

Sea. Researches made in France since 1730 to determine the Longitude at Sea by the artificial measure of time.
LE ROY (J.), 1773. App. 566.

—— Attempts to find the longitude at sea. LE ROY (P.), 1768.

—— Errors in Longitude as determined by Chronometers at sea from the action of the Iron of the Ships.
FISHER (G.), 1820. App. 557.

—— Method of determining Longitude at sea with the help of marine clocks and watches, etc.
BERTHOUD (F.), 1775, 1787, 1792. App. 548.

—— Harrison and Le Roy's attempts to find the Longitude at Sea. LE ROY (J.), 1768. App. 565.

—— Instruments for the determination of Longitude at sea. Voyage of the Marquis of Courtanvaux to verify.
COURTANVAUX (F. C. le T. de), 1768. App. 552.

—— Instruments (New-invented) for facilitating the Knowledge of the Longitude at Sea. LEGUIN (S.), 1790. App. 565.

—— Problem to discover the Longitude at Sea by the same observations as in the case of Latitude.
LOCKE (R.), 1751. App. 566.

—— New machines proposed in France. BERTHOUD, 1773.

—— Invention, theory, construction and trials of new machines.
BERTHOUD (F.), 1773. App. 547.

—— Means for finding Longitude at Sea.
GRANT (C.), 1808. App. 559.

—— Methods, etc., for finding Latitude and Longitude at Sea.
BROWNE (Robert), 1714. App. 550.

—— New method for discovering the Longitude by sea and land.
WHISTON (W.), 1714. App. 580; WHISTON (W.), and Ditton, 1714. App. 580.

—— Petition to the Commissioners for providing a public reward for persons that find it. BROWNE (Robert), 1730. App. 550.

—— Narrative of proceedings relative to.
HARRISON (John), 1765. App. 561.

LOCOMOTIVES (GENERAL REFERENCES)—*continued.*

British. Newcastle-upon-Tyne and North Shields Railway. Experiments of "Collingwood" and "Exmouth" as to consumption of coke and water. NICHOLSON (R.) and Hawthorn.

Burmah. Contracts for Ironwork for Locomotive Engines and Tenders. INDIA, p. 114.

France. Three types of Locomotives. Chemin de fer du Nord. (London Exhibition, 1862.) PETIET (J.), 1862.

New South Wales. Trials of a ten-wheeled Baldwin Engine, 1892. NEW SOUTH WALES, p. 404.

—— Alleged defectiveness and unsuitability of the Baldwin locomotives, 1892. NEW SOUTH WALES, p. 404.

—— Fifty Colonial-made Railway Locomotives, 1889. NEW SOUTH WALES, p. 404.

—— Tests with the new American engines. NEW SOUTH WALES, p. 404.

New Zealand. Coal as a fuel for Locomotives, 1876, '77. NEW ZEALAND, p. 408.

—— Relative merits of American and English Locomotives, 1879–80. NEW ZEALAND, p. 412.

Reading Railroad, Locomotive Engines on the. Report on the use of anthracite coal in. WHISTLER (G. W.), 1849.

Victoria. Return relative to Railway Locomotives, 1871. VICTORIA, p. 378.

Vienna Exhibition of 1873. DEGHILAGE and Morandière.

LOCOMOTIVES (ADHESION OF).

Adhesion to rails for curves of a small radius. MALLET (A.), 1894. Add. 518.

Locomotive Adhesion. ANONYMOUS, 1865, p. 48.

LOCOMOTIVES (COMPOUND).

Compound Locomotives. ANONYMOUS, 1885, p. 42; BAUDRY, 1889; BORRIES, 1886; LAPAGE, 1889; MALLET (A.), 1880, 1890; POLONCEAU (E.), 1889; WORSDELL (T. W.) and von Borries, 1887.

Compound Locomotive of the Rhode Island Locomotive Works. Report. FRANKLIN Institute.

Four cylinders (Northern Railway of France). BOUSQUET (T. B. G. du), 1892.

Simple *v.* compound. SMITH (W. M.), 1892.

Mallet's system. FETTER, 1891.

South West Russian Railways. System compound-tandem. BORODINE, 1892.

UNIVERSITY OF MICHIGAN
3 9015 03463 4561